Exhibit D

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

SECURITIES AND EXCHANGE
COMMISSION,

        Plaintiff,

-*against*-

    20 Civ. 10832 (AT)

RIPPLE LABS, INC., BRADLEY
GARLINGHOUSE,
 and CHRISTIAN A. LARSEN,

        Defendants.

Expert Report of

Allen Ferrell, Ph.D.

October 4, 2021

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I.   INTRODUCTION

A.   QUALIFICATIONS

1.   I am an economist and the Greenfield Professor of Securities Law at Harvard Law School. I received a Ph.D. in economics from the Massachusetts Institute of Technology with fields in econometrics and finance, and a J.D. from Harvard Law School. My Ph.D. dissertation concerned the relationship between stock prices and financial disclosures. After law school, I clerked for Judge Silberman of the United States Court of Appeals for the D.C. Circuit and Justice Kennedy of the Supreme Court of the United States.

2.   I am also a faculty associate at the Kennedy School of Government at Harvard, a fellow at Columbia University's Program on the Law and Economics of Capital Markets, a research associate at the European Corporate Governance Institute, and a member of the editorial board of the Journal of Financial Perspectives. I formerly was a member of the Board of Economic Advisors to the Financial Industry Regulatory Authority ("FINRA"), an academic fellow at FINRA, Chairperson of Harvard's Advisory Committee on Shareholder Responsibility (which is responsible for advising the Harvard Corporation on how to vote shares held by its endowment), the ABA Task Force on Corporate Governance, American Law Institute Project on the Application of U.S. Financial Regulations to Foreign Firms and Cross-Border Transactions, and an executive member of the American Law School section on securities regulation. My current curriculum vitae is listed in Appendix A. I am being compensated for my time on this matter at a rate of $1,250 per hour. My compensation is not contingent on the outcome of this case. No element of compensation is dependent on the opinions offered in this case.

3.   The materials I have considered are listed in Appendix B.

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4.   This report is subject to change or modification should additional relevant information become available which bears on the analysis, opinions, or conclusions contained herein.

B.   BRIEF BACKGROUND ON LITIGATION

5.   Ripple Labs, Inc. ("Ripple") is a San Francisco-based privately held payments technology company that utilizes distributed ledger technology, including the cryptocurrency XRP, in cross-border payment technology.[1] Plaintiff Securities and Exchange Commission (the "SEC") alleges that Defendants[2] engaged in the "unlawful offer and sale of securities in violation of Sections 5(a) and 5(c) of the Securities Act of 1933 ('Securities Act') [15 U.S.C. §§ 77e(a) and 77e(c)]."[3]

6.   The SEC argues that XRP was offered and sold as an "investment contract" and, therefore, should have been registered under the Securities Act, at least as of 2013.[4] The SEC relies on what has become known as the *Howey* test, from the Supreme Court's 1946 decision in *Securities and Exchange Commission v. W. J. Howey Co., et al.*, 328 U.S. 293 (1946). The Court in that case explains:

> "[A]n investment contract for purposes of the Securities Act means a contract, transaction or scheme whereby a person invests his money in a common enterprise and is led to

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[1] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2014 through December 31, 2020. As of September 15, 2014, Ripple Labs, Inc. has been incorporated in the State of Delaware. [Tab 29-31-DE-CA *Good Standing Certificate*, December 15, 2014, Series A, Ripple Labs Inc.pdf, at 1].

[2] Defendants are Ripple, Bradley Garlinghouse, and Christian A. Larsen.

[3] First Amended Complaint, *Securities and Exchange Commission v. Ripple Labs, et al.*, No. 1:20-cv-10832 (S.D.N.Y. February 18, 2021) (hereinafter, the "Complaint"), at ¶ 9.

[4] *See* Complaint, at ¶ 72 ("In August 2013, Ripple started making unregistered offers and sales of XRP in exchange for fiat currencies or digital assets such as bitcoin."), at ¶ 3 ("Ripple engaged in this illegal securities offering from 2013 to the present…").

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expect profits solely from the efforts of the promoter or a third party, it being immaterial whether the shares in the enterprise are evidenced by formal certificates or by nominal interests in the physical assets employed in the enterprise."[5]

7.   The SEC's affirmative theory in its Complaint for why XRP should be deemed an "investment contract" extensively relies upon its characterization of XRP as a "speculative" investment.[6] The alleged speculation is supposedly driven by the hope that Ripple's efforts would somehow find a "use" for XRP at some point in the future, and that XRP's price would rise as a result of those efforts.[7]

8.   In terms of the specific efforts of Ripple that purchasers of XRP allegedly relied upon for an expectation of profit, the SEC points to:

> a. The efforts of Ripple and its Founders to distribute XRP into the marketplace. Indeed, much of the Complaint focuses on delving into the details of various distribution mechanisms, including Ripple's provision of discounts and rebates in doing so.[8]

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[5] Securities and Exchange Commission v. W. J. Howey Co., et al., 328 U.S. 293 (1946), at 298-299.

[6] *See, e.g.*, Complaint, at ¶ 232 ("[P]rincipal reason for anyone to buy XRP was to speculate on it as an investment."). *See also*, Complaint, at ¶ 66 ("Ripple began its efforts by attempting to increase speculative demand and trading volume for XRP…"), at ¶ 69 ("Ripple made it part of its 'strategy' to sell XRP to as many speculative investors as possible."), at ¶ 105 (Ripple sold XRP to "institutional and other accredited investors who are purchasing XRP for speculative purposes"), at ¶ 235 ("[I]n its official application to the NYDFS for XRP II in 2016, Ripple acknowledged that buyers were purchasing XRP for speculative purposes."), at ¶ 396 ("Ripple promoted XRP as a speculative investment when either no use case existed or, with the eventual development of the ODL product, only a small fraction of XRP arguably was being 'used' for a few moments for non-investment purposes before being sold to investors.").

[7] *See, e.g.*, Complaint, at ¶ 241 ("Based on these representations, Ripple's actions, and the economic reality, XRP investors in the Offering had a reasonable expectation of profiting from Ripple's efforts to deploy investor funds to create a use for XRP and bring demand and value to their common enterprise.") *See also*, Complaint, at ¶ 68 ("Under the plan, a future 'user' of XRP as a universal asset (*i.e.*, a bank) would use the speculative trading market to effect money transfers."), at ¶ 83 ("Ripple paid third parties to assist in its efforts to accomplish as widespread a distribution of XRP as possible and to attempt to develop a 'use' for XRP."), at ¶ 243 ("Defendants repeatedly stated publicly that they would undertake significant efforts to develop and foster 'uses' for XRP…"), at ¶ 359 ("The potential 'users' of ODL that Ripple is targeting are money transmitters.").

[8] *See, e.g.*, Complaint, at ¶ 73 ("Larsen orchestrated the initial stage of Ripple's Offering of XRP by approving the timing and amount of offers and sales to: (1) purchasers in the open market ('Market Sales'); (2) investment

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    b.   The formation of an Escrow for certain of Ripple's XRP holdings in 2017.[9]

    c.   Ripple's activities in connection with the listing of XRP on third-party cryptocurrency exchanges.[10]

    d.   Ripple's efforts to artificially prop up a supposedly uneconomic and inefficient On-Demand Liquidity ("ODL") cross-border payments product.[11]

    e.   Entrepreneurial and managerial efforts, including joint ventures focused on the development of XRP use cases.[12]

9.   In terms of the "common enterprise" prong of the *Howey* test, the SEC argues

that, "[b]ecause XRP is fungible, the fortunes of XRP purchasers were and are tied to one

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funds, wealthy individuals, or other sophisticated investors ('Institutional Sales'); and (3) others enlisted to assist Ripple's efforts to develop an XRP market (the 'Other XRP Distributions')."), at ¶ 85 ("In addition, Larsen (beginning in 2015) and Garlinghouse (beginning in 2017) directly participated in the Offering by offering and selling their own holdings of XRP into the same market as Ripple's Market Sales, typically following the same manner of sale."), at ¶ 125 ("At times, rather than directly selling XRP into the market to fund its operations, Ripple funded its dual XRP market-creating and company financing goals by transferring XRP to third parties as compensation. Ripple understood that these parties would in turn sell XRP into the public markets.").

[9] *See, e.g.*, Complaint, at ¶ 253 ("In an email to Ripple's equity shareholders, advisors, and others on June 5, 2017, Garlinghouse emphasized Ripple's efforts to increase XRP's liquidity and price through the XRP Escrow."). *See also*, Complaint, at ¶ 191 ("Defendants' efforts in this regard principally involved monitoring the timing and amount of their XRP sales and purchases, sometimes to coincide with strategic announcements about Ripple or XRP and establishing an escrow for Ripple's own XRP holdings."), at ¶ 223 ("[O]n May 16, 2017, Ripple announced that it would place 55 billion XRP (most of its current holdings) into an cryptographically-secured escrow…"), at ¶ 255 ("[I]n a December 7, 2017 post on its website, Ripple, confirming the formation of the XRP Escrow…").

[10] *See, e.g.*, Complaint, at ¶ 161 ("In 2017 and 2018, Ripple entered into agreements with at least ten digital asset trading platforms … providing for 'listing' and trading incentives with respect to XRP."). *See also*, Complaint, at ¶ 158 ("To support Ripple's efforts to 'list' XRP on digital asset platforms, …"), at ¶ 326 ("On December 14, 2017, Garlinghouse stated … XRP is listed at about fifty exchanges around the world.").

[11] *See, e.g.*, Complaint, at ¶ 365 ("Much of the onboarding onto ODL was not organic or market-driven. Rather, it was subsidized by Ripple."). *See also*, Complaint, at ¶ 131 ("To encourage adoption of ODL, Ripple paid XRP to both the money transmitting businesses and certain market makers that supported the product for their efforts."), at ¶ 283 ("ODL – that 'uses' XRP (which 'use' is not market-driven but subsidized by Ripple…)").

[12] *See, e.g.*, Complaint, at ¶ 273 ("During the Offering, … *made and touted* extensive entrepreneurial and managerial efforts—made with proceeds from the Offering—to the market.") (emphasis in original). *See also*, Complaint, at ¶ 274 (In January 2016, Ripple announced a "joint venture to distribute 'Ripple's solutions' in certain countries…").

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another, and each depend on the success of Ripple's XRP Strategy."[13] To effectuate this XRP

strategy, the SEC alleges that Ripple pooled the capital raised in the offering of XRP to "fund its

efforts to create profits for Ripple and XRP purchasers (in the form of increased *prices* for

XRP)."[14] The SEC further alleges that Ripple used the pooled funds to "fund its operations,

including to finance building out potential 'use' cases for XRP."[15] This purported commonality

supposedly included Ripple itself as "Ripple's (significant) XRP holdings were essentially its

only asset."[16]

10.   In expounding its theory of liability, the SEC repeatedly and extensively points to

various contracts, including contracts entered into by Ripple for the distribution and sales of

XRP, to justify its contention that XRP is an "investment contract."[17]

    C.   **ASSIGNMENT AND CONCLUSIONS**

11.   I have been asked by counsel for Ripple to assess whether the economic evidence

is consistent with the economic assertions made by the SEC in support of its ultimate conclusion

that XRP is an "investment contract." My assessment of the economic evidence includes

consideration of the contracts pursuant to which XRP was distributed by Ripple and the proper

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[13] Complaint, at ¶ 291.

[14] Complaint, at ¶ 90 (emphasis added).

[15] Complaint, at ¶ 293.

[16] Complaint, at ¶ 302.

[17] *See, e.g.*, Complaint, at ¶ 3 ("Ripple engaged in this illegal securities offering … under certain circumstances XRP could be considered an 'investment contract' and therefore a security under the federal securities laws."). *See also*, Complaint, at ¶ 53 ("The Legal Memos warned that there was some risk that XRP would be considered an 'investment contract' (and thus a security) under the federal securities laws depending on various factors."), and at ¶ 231 ("At all relevant times during the Offering, XRP was an investment contract and therefore a security subject to the registration requirements of the federal securities laws.").

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characterization of XRP from an economic perspective. I offer no opinion on the legal question whether these XRP contracts were "investment contracts" within the meaning of Section 5 of the Securities Act.

12.   In Section II, I will begin by first presenting some additional background on Ripple, and the overall landscape of its various contractual obligations. With respect to the latter, I will provide an overview of Ripple's private equity ownership contracts – which no one disputes *do* constitute "securities" – as well as the Ripple contracts for the distribution of XRP that, according to the SEC, support that the alleged economic substance of XRP constitute an "investment contract" and, hence, a "security." The economic substance of Ripple's private equity ownership reflects the following exchange: the pooling of capital to fund Ripple's business in exchange for a contractual right to a share of the profits if Ripple's efforts to manage and develop its business operations prove successful. In sharp contrast, as I will show, the economic substance of the Ripple XRP contracts reflects no such exchange, with no corresponding right to share in Ripple's profits and with no obligation by Ripple to expend efforts to increase the price of XRP. The fact that Ripple may have used the proceeds of its sales of XRP to help fund its own operations does not change the economic substance of the transaction or create any obligations on the part of Ripple to share its profits with the purchasers of XRP.

13.   In Section III, I will address the SEC's assertion that "profit" from "speculating" on XRP's price increasing would primarily follow as a matter of "economic reality" from Ripple's efforts to manage and develop its business and promoting XRP. As an initial matter, speculative demand is not unique to investment contracts and exists for many commodities and currencies that are clearly not investment contracts. Moreover, the SEC's assertion is

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demonstrably false. My economic analysis demonstrates that XRP's long-run price returns are associated with factors outside Ripple's control, namely, price returns of non-XRP cryptocurrencies. XRP price returns are unrelated to factors over which Ripple may have control, including the various distributions of XRP extensively invoked in the SEC's Complaint.

14.   Finally, in Section IV, I will document that the economic reality of XRP is that it is a virtual currency and is in fact used as a medium of exchange in applications such as Ripple's ODL platform. Ripple's ODL platform simply reflects the dual fact that XRP is a virtual currency, and that Ripple was attempting to develop a new business that would someday benefit the company and its equity shareholders (owners with a contractual right to a share in the profits of Ripple).

15.   Based on my analysis, my review of the materials listed in Appendix B, and my general expertise and experience, I have concluded that:

- From an economic perspective, none of Ripple's contracts for the distribution of XRP entitles the holder of XRP to a share of Ripple's profits if Ripple is successful in its ongoing efforts to manage and develop its business operations or otherwise require Ripple to expend ongoing efforts to increase the price of XRP.

- From an economic perspective, speculative demand is neither unique to nor indicative of an investment contract. Economists have long recognized that speculative demand is widespread among assets that are not securities, including money, foreign exchange, commodities, and virtual currencies.

- The long-run price of XRP for the period August 2013 to December 2020 has not resulted from Ripple's efforts but rather from price movements of non-XRP cryptocurrencies. Accordingly, purchasers of XRP can have no reasonable expectation of profits from the efforts of Ripple.

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- Ripple's XRP distributions increased XRP liquidity and therefore aided Ripple's efforts to provide global financial settlement solutions, such as ODL, but did not have a statistically significant effect on XRP's price.

- From an economic perspective, Ripple and purchasers of XRP are not part of a common enterprise in which proceeds of XRP sales are pooled to create profits for Ripple and XRP holders. Because of differences in both the timing and the duration of holding periods between Ripple and direct and indirect purchasers of XRP, their exposure to XRP price volatility and therefore to risk is different.

- From an economic perspective, XRP is properly viewed as a virtual currency that is used as a medium of exchange in applications such as Ripple's ODL product.

II.   RIPPLE'S BUSINESS AND CONTRACTS

A.   RIPPLE IS A PRIVATELY-HELD PAYMENTS TECHNOLOGY COMPANY

16.   XRP is the native digital asset of the XRP Ledger, an open-source, decentralized blockchain technology.[18]

17.   In 2011 and 2012, a group of individuals developed the XRP Ledger to improve the fundamental limitations of Bitcoin's blockchain.[19] OpenCoin, now Ripple ("the Company"), was formed in 2012 in San Francisco.[20] Shortly after the formation of the Company, the

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[18] The XRP Ledger is a "record of the amount of currency in each user's account and represents the 'ground truth' of the network. The ledger is repeatedly updated with transactions that successfully pass through the consensus process." D. Schwartz, N. Youngs, and A. Britto, "The Ripple Protocol Consensus Algorithm." https://ripple.com/files/ripple_consensus_whitepaper.pdf. *See also*, "XRP: The Best Digital Asset for Global Payments," https://ripple.com/xrp/.

[19] The code for the XRP Ledger was created by Arthur Britto, Jed McCaleb, and David Schwartz between 2011 and the summer of 2012—before Ripple was formed as a company.

[20] *See* XRPL's Origin: "Provide a Better Alternative to Bitcoin," http://xrpl.org/history.html.

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Founders of the Company contributed 80 billion units of XRP to the Company, out of a total of 100 billion units in existence.[21]

18.   Ripple's strategic objective is to provide global financial settlement solutions to enable a worldwide exchange of value akin to the existing exchange of information on the Internet.[22] Ripple and its wholly-owned subsidiaries employ the XRP Ledger, an open-source, decentralized blockchain of digitized information including the cumulative purchases and sales of assets among participants.

19.   Ripple's wholly-owned subsidiary, XRP II, LLC ("XRP II"), founded in 2013, has been organized as a New York limited liability company since at least 2015, and is the entity through which Ripple offered and sold most of its XRP.[23] XRP II is registered as a money service business with the United States Financial Crimes Enforcement Network ("FinCEN") and as a virtual currency business with the New York State Department of Financial Services ("NYDFS").[24]

B.   RIPPLE WAS INITIALLY FUNDED WITH AND CONTINUES TO RECEIVE FUNDING FROM PRIVATE EQUITY INVESTORS

20.   Ripple conducted several rounds of traditional venture capital funding starting in 2012 when it issued "800,000 shares of Common Stock to investors for total cash proceeds of $200,000."[25]

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[21] The XRP Ledger developers wrote the underlying code that automatically generated a fixed supply of 100 billion units of a digital asset, which was distributed to Chris Larsen, Mr. McCaleb, and Mr. Britto, the Founders of the Company. Eighty billion XRP was subsequently transferred to Ripple. *See* Deposition Transcript of David Schwartz, May 26, 2021, at 11:4-7, 13:16-21, 14:7-21, 24:2-7, 143:8-10, and 146:16-21.

[22] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2014 (RPLI_SEC 0090938, at 945).

[23] Complaint, at ¶ 19.

[24] Complaint, at ¶ 19.

[25] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2014 (RPLI_SEC 0090938, at 957).

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21.   Beginning in October 2012 and through December 2013, Ripple issued $6.4 million in convertible notes.[26] In 2014 and through 2019, Ripple issued several rounds of preferred stocks and warrants.[27]

22.   Exhibit 1 shows the breakdown of Ripple's sources of private investor funds.[28] Investors in common and preferred Ripple stock are shareholders of Ripple and as such are entitled to cash dividends when and if declared by the Board of Directors, with priority given to preferred equity holders, *i.e.*, "holders of the [Preferred Stock] shall be entitled to receive cash dividends prior to and in preference to dividends to holders of common stock."[29] Ripple's shareholders also have voting rights, discussed in more detail below.

23.   Not surprisingly, there is no dispute between the parties that Ripple's common stock, preferred stock, convertible notes and warrants all have the economic substance of a "security." The common stock, preferred stock, convertible notes and warrants are all funding mechanisms that enable Ripple to raise funds for its business operations with the holders of these ownership stakes enjoying certain contractual rights to the profits that Ripple might generate from its efforts in managing and developing its business operations. If Ripple is successful in its

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[26] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2014 (RPLI_SEC 0090938, at 953).

[27] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2014 (RPLI_SEC 0090938, at 953 and 955); Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2015, at 17; Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2016, at 17 and 19; Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2018 (RPLI_SEC 0265036, at 063 and 064); Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2019 (RPLI_SEC 0301113, at 146).

[28] In 2012, prior to the filing of the Complaint, OpenCoin (Ripple) received bridge financing from private investors. Between October 2012 and 2013, Ripple could have borrowed up to $1 million using this form of financing. *See, e.g.*, OpenCoin, Inc., *Amended and Restated Note Purchase Agreement*, November 8, 2012 (RPLI_SEC 0321854), OpenCoin, Inc., *Convertible Note Purchase Agreement*, April 26, 2013 (SEC-LIT-EPROD-000092103). *See also*, Notes to Exhibit 1 re stock redemptions and repurchases.

[29] *See, e.g.*, Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2014 (RPLI_SEC 0090938, at 955).

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efforts, then the holders of these instruments will earn a return on their capital by virtue of appreciation and their contractual rights to the profits generated, such as potentially enjoying cash dividends or promised interest payments.

24.   I will now provide some additional detail on these instruments.

i.   Ripple Issued Common Stock

25.   In 2012, Ripple issued 8,000,000 shares of common stock to Chris Larsen, Jed McCaleb, and Arthur Britto and 800,000 shares of common stock to investors for cash proceeds of $200,000.[30] As of March 28, 2016, Ripple was authorized to issue 95,000,000 shares of Class A stock and 18,309,014 shares of Class B stock; both issuances would have a par value of $0.0001.[31]

26.   On July 1, 2017, Ripple effected a two-for-one stock split.[32] The financial information reported after this date reflects the two-for-one stock split. As of December 20, 2019, Ripple was authorized to issue 180,000,000 shares of Class A common stock and 35,331,121 shares of Class B common stock; both issuances would have a par value of $0.0001.[33] The holders of common stock are entitled to receive cash dividends when and if declared by the Board of Directors.[34]

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[30] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2014 (RPLI_SEC 0090938, at 957).

[31] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2016, at 21.

[32] Ripple Labs, Inc., *Consolidated Financial Statements,* December 31, 2018, at 8.

[33] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2019 (RPLI_SEC 0301113, at 149).

[34] Ripple Labs, Inc., *Restated Certificate of Incorporation of Ripple Labs, Inc*., December 3, 2014, at 2; Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2014 (RPLI_SEC 0090938, at 955).

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    ii.   Ripple Issued Convertible Notes and Preferred Stock

    27.   From October 2012 and through December 2013, Ripple issued convertible notes payable on demand by a majority noteholder or on the date 18 months from issuance of the notes. The interest rate on the notes ranged between 2% and 6%.[35] For example, the convertible note purchase agreement dated April 26, 2013 shows that OpenCoin (Ripple's predecessor) borrowed $1 million from accredited investors, Camp One Ventures, LLC ($250,000), BB Trust ($200,000), Google Ventures 2013, L.P. ($100,000) and IDG Technology Venture Investment IV, L.P. ($450,000) between April 26, 2013 and May 6, 2013.[36] Lenders on these notes received 6% interest, payable on or after October 25, 2014. On November 19, 2013, Ripple issued a $2 million promissory note to Core Innovation Capital I, L.P. ("Core").[37]

    28.   Ripple converted the $6.4 million convertible notes and the accrued and unpaid interest on these notes into Series A equity securities in December 2014. Ripple accordingly issued 7,359,045 shares at an average conversion price of $0.92 per share and received $6,770,422 in cash from the preferred stock issuance.[38]

    29.   In December 2014, Ripple issued an additional 4,033,742 shares of Series A redeemable convertible preferred stock, at a price of $1.7808 per share for cash proceeds of $7,091,134 net of issuance cost.[39] As of December 2014, Ripple had received $31.9 million of

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[35] *See, e.g.*, Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2014 (RPLI_SEC 0090938, at 953).

[36] OpenCoin, Inc., *Convertible Notes Purchase Agreement*, Exhibit A, Schedule of Lenders, April 26, 2013 (SEC-LIT-EPROD-000092103, at SEC-LIT-EPROD-000092120).

[37] Ripple Labs, Inc., *Side Letter*, Core Innovation Capital I, L.P., November 19, 2013, at 1.

[38] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2014 (RPLI_SEC 0090938, at 953, 954, and 955).

[39] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2014 (RPLI_SEC 0090938, at 955).

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funding from these preferred stock issuances purchased by accredited investors.[40] The holders of

Series A preferred stock are entitled to receive dividends from Ripple when and if declared by

the Board of Directors.[41] Holders of Series A preferred stock also have general voting rights.[42]

      30.   Ripple continued to receive funding from stock issuances. For example, from

March 2016 through August 2016, Ripple issued 14,482,502 shares of Series B preferred stock at

a purchase price of $3.8117 per share for cash proceeds of more than $55 million, net of issuance

costs.[43] Ripple agreed to use the proceeds from the Series B stock sales for "capital expenditures,

working capital and general corporate purposes."[44] The holders of Series B preferred stock are

entitled to receive dividends from Ripple when and if declared by the Board of Directors.[45]

Holders of Series B preferred stock also have general voting rights.[46]

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[40] Ripple Labs, Inc., *Series A Preferred Stock Purchase Agreement*, December 3, 2014, Schedule A, at S-1 and S-2.

[41] "The holders of shares of Preferred Stock shall be entitled to receive, when, as and if declared by the Board of Directors, out of any assets of this corporation legally available therefor, any dividends as may be declared from time to time by the Board of Directors prior and in preference to any declaration or payment of the dividends to the holders of Common Stock." Ripple Labs, Inc., Class A, B and Series A, *Restated Certificate of Incorporation*, December 3, 2014, at 2.

[42] "The holder of each share of Preferred Stock shall have the right to (1) vote for each share of Class A Common Stock or ten (10) votes for each share of Class B Common Stock…" Ripple Labs, Inc., Class A, B and Series A, *Restated Certificate of Incorporation*, December 3, 2014, at 14.

[43] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2016, at 19.

[44] Ripple Labs, Inc., *Series B Preferred Stock Purchase Agreement*, March 28, 2016, at 2.

[45] "The holders of shares of Preferred Stock shall be entitled to receive, when, as and if declared by the Board of Directors, out of any assets of this corporation legally available therefor, any dividends as may be declared from time to time by the Board of Directors prior and in preference to any declaration or payment of the dividends to the holders of Common Stock." Ripple Labs, Inc., *Restated Certificate of Incorporation*, December 3, 2014, at 2.

[46] "The holder of each share of Preferred Stock shall have the right to (1) vote for each share of Class A Common Stock or ten (10) votes for each share of Class B common stock, as the case may be, into which such Preferred Stock could then be converted…" Ripple Labs, Inc., *Restated Certificate of Incorporation*, December 3, 2014, at 14.

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31.   In December 2019, Ripple issued 3,252,790 shares of Series C participating

redeemable convertible preferred stock ("Series C") at an issuance price of $61.4857 per share

for cash proceeds of $194.8 million, net of issuance costs.[47] Ripple agreed to use the proceeds

from the Series C stock sales to "(i) fund the redemption of certain shares of the Series A

Preferred Stock and Series B Preferred Stock pursuant to the Stockholders' Agreement (as herein

defined), (ii) finance the acquisition of interests in third party entities, (iii) pay the transaction

costs and expenses for the transactions contemplated by this Agreement and (iv) for other

general corporate purposes of [Ripple] and its subsidiaries."[48] The holders of Series C preferred

stock are entitled to receive dividends from Ripple: "holders of Series C shares shall be entitled

to receive dividends payable in Series C shares at a rate of ███% on a quarterly basis. ...

[Ripple] may elect to pay up to ██% of such dividends in cash in lieu of issuing additional

shares."[49] Holders of Series C preferred stock also have general voting rights.[50]

   iii.   *Ripple Issued Warrants*

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[47] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2019 (RPLI_SEC 0301113, at 46).

[48] Ripple Labs, Inc., *Series C Preferred Stock Purchase Agreement*, December 20, 2019, at 6.

[49] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2019 (RPLI_SEC 0301113, at 148). *See also*, Ripple Labs, Inc., *Restated Certificate of Incorporation*, December 20, 2019, at 2 ("Each holder of a share of Preferred Stock shall be entitled to receive, when, as and if declared by the Board of Directors, out of any assets of this corporation legally available therefor, any dividends as may be declared from time to time by the Board of Directors prior and in preference to any declaration or payment of the dividends to the holders of Common Stock.").

[50] "The holder of each share of Preferred Stock shall have the right to (1) vote for each share of Class A Common Stock into which such Preferred Stock could then be converted…" Ripple Labs, Inc., *Restated Certificate of Incorporation*, December 20, 2019, at 17. In addition to general voting rights, holders of Series A, B, and C have certain protective provisions – *e.g.*, a majority of A, B, and C have to approve any issuance of dividends or any stock repurchase.

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C.   RIPPLE'S XRP CONTRACTS

33.   Like any private corporation, Ripple entered into a variety of contracts beyond those creating various equity and debt obligations to its investors (summarized above). For purposes of my review, I and others working under my supervision reviewed a total of 730 contracts (out of more than 1,700) and categorized this universe of contracts based on their common features and their treatment in the Complaint. I grouped Ripple's contracts according to 10 broadly defined categories referenced in the Complaint.[54] Within each of the 10 categories, I selected at least one illustrative contract. As my discussion of these contracts will show, most of these categories identify either a sales contract or specify a particular type of service contract (with several miscellaneous categories such as option contracts). For the sake of concreteness, I discuss at least one illustrative contract from each of the ten categories.

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[51] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2016, at 21. *See also*, Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2017, at 29 (" ████████████████████████ ██ ").

[52] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2017, at 29.

[53] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2017, at 29.

[54] I was informed by Counsel that distributions by Founders and the bounty program identified in the Complaint are outside the scope of my assignment. *See, e.g.*, Complaint, at ¶ 61 ("From 2013 through 2014, Ripple and Larsen made efforts to create a market for XRP by having Ripple distribute approximately 12.5 billion XRP through 'bounty programs' that paid programmers compensation for reporting problems in the XRP Ledger's code.").

34.   As I will document, the economic substance of these contracts stands in sharp

contrast to the economic substance of the contracts creating the various equity and debt

obligations. None of Ripple's contracts for the distribution of XRP entitle the holder of XRP to a

share of Ripple's profits if Ripple is successful in its ongoing efforts to manage and develop its

business operations and none of these contracts require Ripple to expend ongoing efforts to

increase the price of XRP.

i.   Contracts with Wholesale Purchasers

35.   Ripple entered into contracts with wholesale purchasers pursuant to which Ripple

(XRP II) sold XRP to these entities in return for cash (which could be subject to a discount to an

XRP price as defined in the respective contract). These contracts are referenced in the

Complaint, such as when the Complaint points to Ripple's XRP sales to "Institutional Investor

A" at "price discounts of up to 30% below XRP market prices," and to "Institutional Investor B"

at a "10% discount from XRP market prices."[55]

36.   Two illustrative contracts with wholesale purchasers include Ripple's contract

with ███████████████████████████████, dated September 18, 2017 and the

contract with ██████████████████████.[56]

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[55] Complaint, at ¶ 114 ("In 2017, Ripple sold approximately 14.8 million XRP for $2.1 million to Institutional
   Investor A, without restricting Institutional Investor A's ability to resell this XRP into public markets in any
   way, at price discounts of up to 30% below XRP market prices."), at ¶ 115 ("Institutional Investor B paid
   Ripple approximately $6.4 million for its XRP, the first $500,000 of which it obtained in June 2016 at a 10%
   discount from XRP market prices.").

[56] ██████████████████ and XRP II, *Letter Agreement*, September 18, 2017 (RPLI_SEC 0000861),
   Amendment to Letter Agreement, December 27, 2017 (RPLI_SEC_0000488). ██████ and XRP II, *Master XRP
   Purchase Agreement*, August 3, 2017 (RPLI_SEC_0000792).

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37.   The contract with ████████ indicates that Ripple was to sell XRP at a discount of ██% for purchases in 2017 and a discount of ██% for purchases in 2018.[57] This contract further specifies that ████████ would be exposed to "material risks associated with virtual currency, including XRP," such as the "volatility and unpredictability of the price of virtual currency relative to fiat currency may result in significant loss over a short period of time"[58] on their purchases of XRP.

38.   The contract with ██████ indicates that Ripple was to sell XRP at a discount of ██% from the specified price.[59] This contract also specifies that ██████ would be exposed to "material risks associated with virtual currency, including XRP," such as the "volatility and unpredictability of the price of virtual currency relative to fiat currency may result in significant loss over a short period of time"[60] on their purchases of XRP.

39.   Pursuant to the contract with ██████, Ripple sold approximately ████████ XRP to ██████ on June 9, 2016,[61] and another approximately ████████ XRP on June 23, 2016.[62]

40.   These contracts include a lockup period during which the wholesale purchaser cannot sell XRP and also includes a specification on the amount that can be sold on a daily basis after the lockup period:

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[57] ████████████████ and XRP II, *Letter Agreement*, September 18, 2017 (RPLI_SEC 0000861, at 861) ("'Discount Factor' means a percentage equal to (i) 100% minus (ii) (a) for purchases occurring during 2017, ██% and (b) for purchases occurring during 2018, ██%.").

[58] ████████████████ and XRP II, *Letter Agreement*, September 18, 2017 (RPLI_SEC 0000861, at 867).

[59] ██████ and XRP II, *Summary of XRP Purchase*, June 9, 2016 (RPLI_SEC 0000626, at 626) and ██████ and XRP II, *Summary of XRP Purchase*, June 23, 2016 (RPLI_SEC_0000636, at 636).

[60] ██████ and XRP II, *Master XRP Purchase Agreement*, August 3, 2017 (RPLI_SEC 0000792, at 796).

[61] ██████ and XRP II, *Summary of XRP Purchase*, June 9, 2016 (RPLI_SEC 0000626, at 626).

[62] ██████ and XRP II, *Summary of XRP Purchase*, June 23, 2016 (RPLI_SEC 0000636, at 636).

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"**Transfer Restriction**: Neither the Purchased XRP nor any interest therein may be sold, pledged or otherwise transferred to any person from the Date of Purchase through July 10th, 2016 (the 'Lockup Period') unless that person also agrees not to re-sell or otherwise distribute the Purchased XRP to any other party during the Lockup period.

…

The Purchaser agrees that for sixty (60) days after the expiration of the thirty (30) day Lockup Period set forth in the paragraph immediately above (or between July 10, 2016 and September 10, 2016) the amount of Purchased XRP it may sell on a daily basis shall be limited to five (5) percent of the Average Daily Trading Volume. … The parties agree that after September 10, 2016 Purchaser need no longer comply with the five (5) percent trading volume limitation set forth above."[63]

41.   Unlike the private equity ownership contracts, the contract with █████ does not give █████ any contractual right to a share of Ripple's profits if Ripple is successful in its ongoing efforts to manage and develop its business operations or impose any obligation on Ripple to expend ongoing efforts to increase the price of XRP. In this sense, it is similar to an entity purchasing diamonds from De Beers or barrels of oil from Exxon Corporation.

ii.   *Contracts with Programmatic Sellers*

42.   Ripple also entered into contracts with programmatic sellers. These contracts are referenced in the Complaint, such as when the Complaint points to XRP sales that were limited so as not to exceed a percentage of XRP's daily trading volume.[64]

43.   For example, pursuant to the contract with ████████████████████, effective June 2, 2017, ████ was to transact in XRP according to a programmatic schedule

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[63] █████ and XRP II, *Summary of XRP Purchase*, June 9, 2016 (RPLI_SEC 0000626, at 627) and █████ and XRP II, *Summary of XRP Purchase*, June 23, 2016 (RPLI_SEC 0000636, at 637).

[64] "At Ripple's direction, the intermediaries such as the Market Maker ensured that Market Sales were programmatically set not to exceed a certain percentage of XRP's overall daily trading volume, and Ripple referred to the Market Sales as 'programmatic sales.'" *See* Complaint, at ¶ 99.

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("Programmatic Market Making Activity") and in return was to receive a fee that was calculated

as a percentage of XRP that was traded programmatically during a particular calendar month.[65]

> "Ripple may, at any time and in its sole discretion, direct ██ remit any portion of or all of the proceeds of ██ Programmatic Market Activity, as such amounts are reported in the then-current daily reporting of XRP Programmatic Market Activity required in Section 4. ██ shall promptly (i) remit ██% of the amounts of such proceeds to Ripple in a payment method(s) directed by Ripple in its sole discretion and (ii) transfer ██% of the amounts of such proceeds to a wallet or account of ██ for its own benefit."[66]

44.   The contract includes the following termination provision:

> "The Term of this Agreement shall … continue until the earlier of: a. 12 months; b. termination by Ripple upon 180 calendar days' notice to ██; c. upon written notice of termination by a Party if the other Party is in material breach of this Agreement, if the breaching party does not, within ten (10) calendar days after receiving written notice describing an alleged material breach of this Agreement, cure the alleged material breach; or d. upon written notice in the event that the other Party has filed or has filed against it a petition for voluntary or involuntary bankruptcy or similar relief from insolvency, makes an assignment for the benefit of its creditors, has a receiver appointed for all or a substantial part of its business or assets, or otherwise admits in writing of its inability to meet debts as they become due. Upon termination, ██ shall return to Ripple all XRP, if any, transferred from Ripple to ██ …"[67]

45.   Unlike the private equity ownership contracts, the contract with ██ does not

give ██ any contractual right to a share of Ripple's profits if Ripple is successful in its ongoing

efforts to manage and develop its business operations or impose any obligation on Ripple to

expend ongoing efforts to increase the price of XRP. Here, ██ is similar to an entity selling

diamonds from De Beers or barrels of oil from Exxon Corporation for an agreed-upon fee.

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[65] ██ and Ripple Markets Inc. ("Ripple Markets"), *Programmatic Market Activity Agreement*, June 2, 2017 (RPLI_SEC 0507300).

[66] ██ and Ripple Markets, *Programmatic Market Activity Agreement*, June 2, 2017 (RPLI_SEC 0507300, at 301). The contract with ██ was amended in March 2018. *See* ██ and Ripple Markets, *Amendment to Programmatic Market Activity Agreement*, March 1, 2018 (RPLI_SEC 0537727).

[67] ██ and Ripple Markets, *Programmatic Market Activity Agreement*, June 2, 2017 (RPLI_SEC 0507300, at 301-302).

iii.   Contracts with Market Makers[68]

46.   Ripple also entered into contracts with market makers, another type of Ripple

contract referenced in the Complaint.[69] For example, Ripple entered into a market making

contract with ███████, effective as of February 7, 2014.[70] Pursuant to this contract, Ripple

would deliver a specified number of units of XRP to the market maker that they in turn use to

"promote liquidity of fiat and crypto currencies within the Ripple Network" and "to quote

binding bid and offer prices for Currency Pairs…within the Ripple Network."[71] For example,

Ripple delivered ███████ XRP units pursuant to the initial market maker contract with which

███████ was obligated to use to "make binding bids and offers" in certain specified currency

pairs.[72]

47.   Starting in 2017, Ripple expanded the scope of the market maker's

responsibilities beyond the XRP Ledger to include quoting bid and offer spreads in specified

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[68] The terminology "market maker" is used to describe "a trading firm that posts two-sided quotes in XRP pairs."
See, e.g., ████████████████████████████ and Ripple Markets, *Market Maker and Programmatic Market Activity Agreement*, February 14, 2017 (RPLI_SEC 0899145, at 145).

[69] "Ripple—through its agents, including Larsen and Garlinghouse—offered and sold XRP for investment to influential players in the digital asset space, including XRP market makers…" *See* Complaint, at ¶ 104. *See also*, Complaint, at ¶ 131 ("To encourage adoption of ODL, Ripple paid XRP to both the money transmitting businesses and certain market makers that supported the product for their efforts.").

[70] ██████ and Ripple Markets, Market Making Agreement, February 7, 2014 (RPLI_SEC 0507336); ██ ██████ and Ripple Markets, RE: Renewal of Market Making Agreement between ██████████████ LLC ("Market Maker") and Ripple Markets, Inc. entered into as of February 7, 2014, April 27, 2016 (SEC-LIT-EPROD-000791045).

[71] ██████ and Ripple Markets, *Market Making Agreement*, February 7, 2014 (RPLI_SEC 0507336, at 336). As defined in the contract, "The Ripple Network" means the "decentralized, open source, global payment network operating on the Ripple protocol," also known as the XRP Ledger. *See* ██████ and Ripple Markets, *Market Making Agreement*, February 7, 2014 (RPLI_SEC 0507336, at 337).

[72] ██████ and Ripple Markets, *Market Making Agreement*, February 7, 2014 (RPLI_SEC 0507336, at 336). Pursuant to the contract, Ripple was to deliver ████████ XRP "within seven (7) days after the Effective Date" and "if there is one – on the first day of the First Renewal Term" an additional ████████ XRP. *See* ██ ██████ and Ripple Markets, *Market Making Agreement*, February 7, 2014 (RPLI_SEC 0507336, at 343-344).

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trading pairs on cryptocurrency (digital asset) exchanges such as Bitstamp and Kraken.[73] The

market makers could also provide liquidity on additional exchanges.[74] The 2018 contract

between Ripple and ▮▮▮▮▮▮ described its purpose as:

> "Pursuant to the terms and conditions of this Agreement, and for good and valuable consideration, Market Maker agrees to (1) engage in efforts to promote liquidity for the buying and selling of XRP, the asset native to the Ripple Consensus Ledger ('Market Making Activity') and (2) to transact in XRP pursuant to a programmatic schedule ('Programmatic Market Making Activity') provided by Ripple. In return for this Market Making activity, Ripple will compensate Market Maker…"[75]

48.   The contract also includes the following termination provision:

> "The Term of this Agreement shall … continue until the earlier of: a. 12 months; b. termination by Ripple upon 180 calendar days' notice to [▮▮▮▮▮▮]; c. upon written notice of termination by a Party if the other Party is in material breach of this Agreement, if the breaching party does not, within ten (10) calendar days after receiving written notice describing an alleged material breach of this Agreement, cure the alleged material breach[.]"[76]

49.   Starting in 2019, Ripple entered into market making contracts with market makers

such as ▮▮▮▮ and ▮▮▮▮▮▮▮▮▮▮▮▮ to provide market making in specified

currency pairs and exchanges that support the Ripple ODL ("xRapid") cross-border payments

product.[77] Per the contract Ripple entered with ▮▮▮, effective as of July 1, 2019, ▮▮▮:

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[73]   ▮▮▮▮▮▮ and Ripple Markets, *Market Maker and Programmatic Market Activity Agreement*, February 14, 2017 (RPLI_SEC 0899145, at 145-146) noting that "Market Maker agrees to support subsequent XRP listings at External Digital Asset Exchanges or off-Ripple Consensus Ledger digital asset exchanges, (including, but not limited to, Kraken, CoinCheck and Bitstamp) as they become available so long as it is operationally viable to do so, and Market Maker can meet all regulatory requirements."

[74]   *See, e.g.*, ▮▮▮▮▮▮ and Ripple Markets, *Market Maker and Programmatic Market Making Activity Agreement*, March 1, 2018 (RPLI_SEC 0537696, at 96-97) and ▮▮▮▮▮▮ and Ripple Markets, *Market Maker and Programmatic Market Making Activity Agreement*, February 14, 2017 (RPLI_SEC 0899145, at 145-146).

[75]   ▮▮▮▮▮▮ and Ripple Markets, *Market Maker and Programmatic Market Making Activity Agreement*, March 1, 2018 (RPLI_SEC 0537696, at 696).

[76]   ▮▮▮▮▮▮ and Ripple Markets, *Market Maker and Programmatic Market Making Activity Agreement*, March 1, 2018 (RPLI_SEC 0537696, at 699).

[77]   *See, e.g.*, ▮▮▮ and Ripple Payments Inc. ("Ripple Payments"), *Master XRapid Market Maker Services Agreement*, July 1, 2019 (RPLI_SEC 0809256); ▮▮▮▮▮▮ and Ripple Payments, *Master XRapid Market Maker Agreement*, July 29, 2019 (RPLI_SEC 0899563).

"shall act as a market maker for XRP in trades for specified currency pairs on (i) the Mexican digital asset exchange, Bitso ('Bitso') which support xRapid, (ii) the Philippines digital asset exchange, Coins.pro ('Coins'), which supports xRapid and (ii) other similar xRapid exchanges or markets as Ripple shall require..."[78]

50.   Further, Ripple pays ▮▮▮ a monthly exchange service fee and an XRP volume

fee.[79] The market maker is entitled to the gains (and losses) in connection with their transactions:

"**Service Fees**. In consideration for its Services and subject to Section 8 (Service Availability), Ripple shall pay Service Provider on a monthly basis (each calendar month, a 'Payment Period [']) (a) ▮▮▮▮▮▮▮▮▮▮▮, and (b) ▮▮▮▮▮▮▮▮▮ ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮ (together, 'Service Fees')."[80] (emphasis in original)

51.   Again, unlike the private equity ownership contracts, the contracts with market

makers do not give these entities any contractual right to a share of Ripple's profits if Ripple is

successful in its ongoing efforts to manage and develop its business operations or impose any

obligation on Ripple to expend ongoing efforts to increase the price of XRP. Regardless of

whether Ripple's efforts are ultimately successful, the market maker, such as ▮▮▮▮▮▮▮▮

and ▮▮▮▮▮▮▮, has a contractual right to the specified compensation if the market maker

performs its obligations under the agreement.

    iv.   *Contracts with Exchanges*

52.   Another set of contracts that Ripple entered into and also referenced in the

Complaint are Ripple's contracts with a small subset of exchanges that trade XRP.[81] Some of the

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[78] ▮▮▮ and Ripple Payments, *Master XRapid Market Maker Services Agreement*, July 1, 2019 (RPLI_SEC 0809256, at 256).

[79] ▮▮▮ and Ripple Payments, *Master XRapid Market Maker Services Agreement*, July 1, 2019 (RPLI_SEC 0809256, at 258).

[80] ▮▮▮ and Ripple Payments, *Master XRapid Market Maker Services Agreement*, July 1, 2019 (RPLI_SEC 0809256, at 258).

[81] *See*, Complaint, at ¶ 322 ("Ripple undertook extensive efforts—starting in at least late 2015—to persuade digital asset trading companies to permit investors to buy and sell XRP on their platforms, especially those that would

contracts with exchanges explicitly specify that exchanges purchase XRP "solely to resell or

otherwise distribute the Purchased Ripple Currency to Purchasers, and not to use the Purchased

Ripple Currency as an End User or for any other purpose."[82] Per the guidelines of the contracts,

the exchanges are not investors in Ripple. Exchanges do not purchase XRP as an investment with

investment being defined as "the purchase or acquisition of [XRP] with the expectation that such

[XRP] will generate income or appreciate in value in the future."[83] Pursuant to these contracts,

the XRP does "not represent a right to make any demand on XRP Fund II…"[84]

53.   For example, on January 11, 2017, Ripple entered into an "XRP/EUR Volume

Incentive Program" with the cryptocurrency exchange ███████.[85] The purpose of the contract is

defined as:

> "The Parties are entering into this Agreement in an effort to increase the liquidity of
> XRP ... through the application of certain XRP transaction volume incentives ...
> ███████ agrees to engage in efforts to promote the liquidity of XRP on its exchange
> platform by implementing an incentive program applicable to a selection of its
> qualified registered members of ███████ services. In return for ███████ efforts
> intended to increase XRP liquidity, Ripple agrees to reserve certain and defined
> incentives..."[86]

54.   The contract includes the following termination provision:

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make XRP tradable against the USD…"). *See also*, Complaint, at ¶ 323 ("On May 18, 2017, Ripple Agent-3 tweeted that [Platform B] introduces New Fiat Pairs for XRP Trading! USD, JPY, CAD, EUR @Ripple.").

[82] ███████ and XRP Fund II, *Ripple Currency Wholesale Sales Order*, September 3, 2013 (RPLI_SEC 0304181, at 183).

[83] ███████ and XRP Fund II, *Ripple Currency Wholesale Sales Order*, September 3, 2013 (RPLI_SEC 0304181, at 183 and 186).

[84] ███████ and XRP Fund II, *Ripple Currency Wholesale Sales Order*, September 3, 2013 (RPLI_SEC 0304181, at 183).

[85] ███████ and Ripple Markets, *XRP/EUR Volume Incentive Program*, *XRP/EUR Fee Rebate Program*, January 11, 2017 (RPLI_SEC 0507279).

[86] ███████ and Ripple Markets, *XRP/EUR Volume Incentive Program*, *XRP/EUR Fee Rebate Program*, January 11, 2017 (RPLI_SEC 0507279, at 279).

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"This Agreement shall continue until the earliest of: 1) The expiration of the Volume Incentive Program on March 31, 2017 at 11:59 pm EST; 2) Upon written notice of termination by a party if the other party is in material breach of this Agreement, if the breaching party does not, within ten (10) calendar days after receiving written notice describing an alleged material breach of this Agreement, cure the material failure; or 3) Upon the mutual agreement of the Parties to terminate this Agreement."[87]

55.   Ripple reserved a rebate pool pursuant to a "XRP/EUR Fee Rebate Program" agreement that was used to pay rebates to eligible participants as a percentage rebate of █████ fees, with the percentage of rebate to decline over the duration of the program.[88] The trading fee rebate is defined as:

"Until 10 February 2017: ██ % of ████████ trading fees, up to ██████. Until 28 February 2017: ██% of ███████ trading fees, up to ██████. Until 31 March 2017: ██% of ███████ trading fees, up to ██████ and until 30 April 2017: ██% of ████████ trading fees, up to ██████."[89]

56.   Unlike the private equity ownership contracts, the contracts with exchanges do not give these entities any contractual right to a share of Ripple's profits if Ripple is successful in its ongoing efforts to manage and develop its business operations or impose any obligation on Ripple to expend ongoing efforts to increase the price of XRP. Rather, contracts with exchanges provide contractually agreed-upon compensation to the exchanges for, among other things, helping to improve liquidity in the market.

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[87]   ███████ and Ripple Markets, *XRP/EUR Volume Incentive Program*, *XRP/EUR Fee Rebate Program*, January 11, 2017 (RPLI_SEC 0507279, at 283). Note that the original contract with ███████ had a termination date of March 31, 2017 but the date was updated to April 30, 2017 (███████ and Ripple, *XRP/EUR Fee Rebate Program*, January 11, 2017 (RPLI_SEC 0507279, at 283).

[88]   ███████ and Ripple Markets, *XRP/EUR Volume Incentive Program*, *XRP/EUR Fee Rebate Program*, January 11, 2017 (RPLI_SEC 0507279, at 287-292).

[89]   ███████ and Ripple Markets, *XRP/EUR Volume Incentive Program*, *XRP/EUR Fee Rebate Program*, January 11, 2017 (RPLI_SEC 0507279, at 287).

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v.   Contracts with On-Demand-Liquidity Customers

57.   Ripple developed the ODL product to "[d]eliver instant cross-border payments without pre-funding."[90] The Complaint devotes a significant amount of attention to the ODL product.[91] Ripple markets ODL primarily to companies providing cross-border transfers to their customers, commonly known as remittances, from developed countries to developing countries.[92]

58.   In 2019, Ripple entered into an agreement with MoneyGram,[93] the second largest remittance business.[94] Ripple gave rebates and paid other incentives to MoneyGram as part of its strategy to develop a brand awareness for its ODL product and build its reputation in this space.[95] More recently, Ripple's customers for ODL have been FinTech startups looking for fast growth and new technologies that can make young companies competitive with established

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[90] "Free Working Capital with On-Demand Liquidity," https://ripple.com/ripplenet/on-demand-liquidity/.

[91] *See, e.g.*, Complaint, at ¶ 365 ("Much of the onboarding onto ODL was not organic or market-driven. Rather, it was subsidized by Ripple."). *See also*, Complaint, at ¶ 131 ("To encourage adoption of ODL, Ripple paid XRP to both the money transmitting businesses and certain market makers that supported the product for their efforts."); at ¶ 283 ("ODL – that 'uses' XRP (which 'use' is not market-driven but subsidized by Ripple.").

[92] "Free Working Capital with On-Demand Liquidity," https://ripple.com/ripplenet/on-demand-liquidity/.

[93] "In June 2019, [MoneyGram] entered into a commercial agreement with Ripple Labs Inc. … to utilize Ripple's On Demand Liquidity ('ODL') platform (formerly known as xRapid), as well as XRP, to facilitate cross-border non-U.S. dollar exchange settlements. The Company is compensated by Ripple for developing and bringing liquidity to foreign exchange markets, facilitated by the ODL platform, and providing a reliable level of foreign exchange trading activity." MoneyGram SEC Filing Form 10-K, Fiscal Year Ended December 31, 2019 ("MoneyGram 2019 10-K"), at 2. *See also*, Preclearance letter from MoneyGram to U.S. Securities and Exchange Commission, November 22, 2019 (SEC-LIT-EPROD-000071389, at 391) (hereinafter, "Preclearance letter").

[94] Preclearance letter (SEC-LIT-EPROD-000071389, at 393). *See also*, MoneyGram and Ripple, *Ripple Work Order #1*, June 17, 2019 (RPLI_SEC0239684); Deposition Transcript of Lawrence Angelilli, CFO of MoneyGram, August 3, 2021 ("Deposition Transcript of Lawrence Angelilli"), at 30:21-25 ("Q. What -- how do you rank as a money remitter? A. … under any kind of public information, we're usually considered the second largest or the third largest depending on what metric you use."); "MoneyGram," https://imtconferences.com/moneygram/ ("Today MoneyGram is the second largest transfer company in the world…").

[95] Preclearance letter (SEC-LIT-EPROD-000071389, at 393-394). *See also*, MoneyGram and Ripple, *Ripple Work Order #1*, June 17, 2019 (RPLI_SEC0239684); Deposition Transcript of Lawrence Angelilli, at 211:15-212:10.

industry players (such as MoneyGram), including startup payment service providers ("PSP")[96]

and digital companies, such as Azimo, TransferGo, and Nium.[97]

59.　　Given the prominence of these contracts in the Complaint, I will discuss separate

rebates and incentives to MoneyGram in more detail in Section IV.B. But, unlike the private

equity ownership contracts, the contract with MoneyGram does not include any contractual right

to a share of Ripple's profits if Ripple is successful in its ongoing efforts to manage and develop

its business operations or impose any obligation on Ripple to expend ongoing efforts to increase

the price of XRP.

　　vi.　　Lease and Loan Contracts

60.　　Yet another type of contract identified in the Complaint are lease and loan

contracts.[98] For example, Ripple entered into a lease contract with ███████████████

█████████, effective June 2019.[99] Per this contract, Ripple would lease XRP to

██████████ in return for a fee (such as ██% of monthly fair value of the lease amount).[100] Upon

termination of the lease contract, ██████████ returns the XRP to Ripple.[101]

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[96] A PSP offers online services for accepting electronic payments by a variety of payment methods including credit card, bank-based payments such as direct debit, bank transfer, and real-time bank transfer based on online banking. *See, e.g.*, "What is Payment Service Provider," https://www.vapulus.com/en/what-is-payment-service-provider/.

[97] Deposition Transcript of Asheesh Birla, General Manager of RippleNet, June 23, 2021, at 237:24-25 (Azimo); "TransferGo Partners with Ripple to Offer Global Real-Time Payments Everywhere to Everyone," https://ripple.com/insights/transfergo-partners-with-ripple-to-offer-global-real-time-payments-everywhere-to-everyone/ (TransferGo); "Nium," https://ripple.com/customer-case-study/nium/ (Nium).

[98] "Another example involves RippleWorks' eventual investment into a fund that wished to invest in digital assets ('XRP Fund B') and Ripple's 'loan' of XRP to that fund so that it could engage in market-making activities." *See* Complaint, at ¶ 142.

[99] ██████████ and XRP II, *Master XRP Lease Agreement*, June 24, 2019 (RPLI_SEC 0898863).

[100] ██████████ and XRP II, *Master XRP Lease Agreement*, June 24, 2019 (RPLI_SEC 0898863, at 864).

[101] ██████████ and XRP II, *Master XRP Lease Agreement*, June 24, 2019 (RPLI_SEC 0898863, at 864).

61.   The contract specifies that the purpose of the lease to [REDACTED] was to "enable

[REDACTED] to conduct any activities in the virtual currency space, subject to Section 2.d

(Compliance with Laws) and Section 5 (Lease Restrictions)."[102] The Lease Restrictions are

defined as:

> "[REDACTED] agrees that its Leases with respect to the Leased XRP shall be
> conducted only on exchanges registered with the U.S. Financial Crimes Enforcement
> Network (FinCEN), and [REDACTED] shall obtain the XRP it returns to [Ripple] as
> provided in Section 1(f) of this Agreement only from such exchanges."[103]

62.   Again, unlike the private equity ownership contracts, the contract with

[REDACTED] does not give [REDACTED] any contractual right to a share of Ripple's profits if

Ripple is successful in its ongoing efforts to manage and develop its business operations or

impose any obligation on Ripple to expend ongoing efforts to increase the price of XRP.

vii.   Custody Arrangements

63.   The Complaint also identifies Ripple's custodial contracts.[104] For example, Ripple

entered an XRP Purchase Agreement with [REDACTED], dated June 23, 2016.[105] Per this contract,

Ripple offers a custody service to [REDACTED] for the XRP purchased from Ripple. The contract

describes the custody service as:

> "[A]t the election of Purchaser and subject to payment in full of the Purchase Price of
> the Purchased XRP to be purchased by Purchaser, XRP II shall act as custodian on
> behalf of the Purchaser of the Purchased XRP. The Purchased XRP shall be released

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[102]   [REDACTED] and XRP II, *Master XRP Lease Agreement*, June 24, 2019 (RPLI_SEC 0898863, at 863).

[103]   [REDACTED] and XRP II, *Master XRP Lease Agreement*, June 24, 2019 (RPLI_SEC 0898863, at 868).

[104] Complaint, at ¶ 115 ("From at least 2016 through 2019, Ripple sold approximately 115 million XRP to an entity
('Institutional Investor B') that describes itself as a 'full-service digital currency prime broker' that 'provide[s]
investors with a secure marketplace to trade, borrow, lend & custody digital currencies.' Institutional Investor B
paid Ripple approximately $6.4 million for its XRP, the first $500,000 of which it obtained in June 2016 at a
10% discount from XRP market prices.").

[105]   [REDACTED] and XRP II, *XRP Purchase Agreement*, June 23, 2016 (RPLI_SEC 0000636, at 636).

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to Purchaser promptly upon receipt of written instructions providing for the release of such Purchased XRP to Purchaser…"[106]

64.   The purchased XRP exposes ███████████████ to risks:

"Upon XRP II's transmission of the Purchased XRP to the Purchaser or its designated recipient(s) title to and risk of loss of the Purchased XRP passes to the Purchaser."[107]

65.   Unlike the private equity ownership contracts, the contract with ████ does not give it any contractual right to a share of Ripple's profits if Ripple is successful in its ongoing efforts to manage and develop its business operations or impose any obligation on Ripple to expend ongoing efforts to increase the price of XRP.

viii.   Marketing and Incentive Contracts

66.   The Complaint also identifies Ripple's service and marketing contracts.[108] Ripple entered a contract with ██ Technologies, Inc. ("██"),[109] effective November 1, 2018, whereby Ripple would pay a bi-monthly development service fee of ███████ XRP, or ███████ XRP on "each of the first and fifteenth day of each calendar month…"[110] In return, ███ will develop services that promote the use of "the XRP Ledger, XRP, the technologies underlying Ripple's

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[106] ████ and XRP II, *XRP Purchase Agreement*, June 23, 2016 (RPLI_SEC 0000636, at 637).

[107] ████ and XRP II, *XRP Purchase Agreement*, June 23, 2016 (RPLI_SEC 0000636, at 638).

[108] Complaint, at ¶ 149 ("For example, a November 1, 2018, two-year 'Services and Marketing Agreement' with one entity promised 'certain development services to promote technologies of interest to Ripple.'").

[109] ███ Technologies, Inc. creates products for users that make it easier to consume premium services. For example, ████ uses XRP and the Interledger Protocol to facilitate transacting with Internet content creators. *See* ██████ ██████████████. *See also*, ████ and Ripple, *Services and Marketing Agreement*, November 1, 2018 (RPLI_00280784, at 784).

[110] ████ and Ripple, *Services and Marketing Agreement*, November 1, 2018 (RPLI_00280784, at 786).

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xCurrent, xRapid and xVia products, or other technologies of interest to Ripple."[111] Ripple has a

█% investment in ██.[112] The contract terminates after 24 months.[113]

67.   ███ can further engage a third party for certain projects, defined as "marketing

services" in the same contract.[114] Subject to their approval, Ripple would pay certain third parties

in XRP.[115] The contract limits the amount of XRP that can be transferred to "████████

██████ of global daily XRP volume…"[116]

68.   Unlike the private equity ownership contracts, the contract with ███ does not

give ███ any contractual right to a share of Ripple's profits if Ripple is successful in its ongoing

efforts to manage and develop its business operations or impose any obligation on Ripple to

expend ongoing efforts to increase the price of XRP. Rather, ███ simply earns fees from Ripple

associated with their contractual obligations to develop services.

69.   Similarly, on September 24, 2018, Ripple entered into a Marketing Incentive

Agreement with ████████████, whereby Ripple incentivized ███ to market Ripple

products to ███ financial institution customers.[117] This agreement stipulates that Ripple would

make incentive payments to ███ conditional on ███ customers reaching a specific level of

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[111] ██ and Ripple, *Services and Marketing Agreement*, November 1, 2018 (RPLI_00280784, at 784).

[112] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2019 (RPLI_SEC 0301113, at 157).

[113] ██ and Ripple, *Services and Marketing Agreement*, November 1, 2018 (RPLI_00280784, at 786).

[114] ██ and Ripple, *Services and Marketing Agreement*, November 1, 2018 (RPLI_00280784, at 788-789).

[115] ██ and Ripple, *Services and Marketing Agreement*, November 1, 2018 (RPLI_00280784, at 788).

[116] ██ and Ripple, *Services and Marketing Agreement*, November 1, 2018 (RPLI_00280784, at 789).

[117] ██ and Ripple Services Inc. ("Ripple Services"), *Marketing Incentive Agreement*, September 24, 2018 (RPLI_SEC 0894629, at 629).

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interbank cross-border fiat currency transfers using Ripple's products.[118] For example, Ripple incentives include XRP distributions to ███ to compensate them for waiving ██████ fees for customers that complete cross-border transactions, for paying a ██████████ to customers based on achieving certain transaction volume milestones on RippleNet, and as reimbursement for customer ██████ expense.[119] Additionally, Ripple will pay ███ an incentive for total volume of payments settled through the hosted platform ███ is developing for providing xCurrent to their customers and RippleNet Payments for all "inter-financial institution cross-border production payments between RippleNet Members over RippleNet where at least one (1) RippleNet Member is a Customer, Ripple will pay ██████████ ██████ of such cross-border volume in XRP."[120] Furthermore, Ripple will pay ███ XRP based on the volume of ██████████ payment volume.[121]

70.   ███ earns fees and other compensation from Ripple associated with their contractual obligations to help develop certain services with no ongoing obligations for Ripple to expend efforts to increase XRP's price. Unlike the private equity ownership contracts, the service and marketing contracts do not give these entities receiving XRP a contractual right to a share of Ripple's profits if Ripple is successful in its ongoing efforts to manage and develop its business operations or impose any obligation on Ripple to expend ongoing efforts to increase the price of XRP.

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[118] ███ and Ripple Services, *Marketing Incentive Agreement*, September 24, 2018 (RPLI_SEC 0894629, at 636).

[119] ███ and Ripple Services, *Marketing Incentive Agreement*, September 24, 2018 (RPLI_SEC 0894629, at 629-630).

[120] ███ and Ripple Services, *Marketing Incentive Agreement*, September 24, 2018 (RPLI_SEC 0894629, at 629-630).

[121] ███ and Ripple Services, *Marketing Incentive Agreement*, September 24, 2018 (RPLI_SEC 0894629, at 630).

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ix.   Employee and Executive Compensation Contracts

71.   Ripple periodically grants compensation in the form of XRP. This is another type
of contract referenced in the Complaint.[122] For example, on May 9, 2018, a Ripple employee
received an Employment Offer Letter pursuant to which he will receive "███████ XRP annually
on the anniversary of your Start Date for the years 2019, 2020, 2021 and 2022 (the 'XRP
Awards') provided [he is] continuously employed full-time by the Company on such anniversary
dates."[123] Ripple also entered into an XRP award agreement, amended in 2017 and 2018,
whereby it granted an aggregate of ██████ XRP to Ripple's CEO.[124] The contract included
provisional "vesting contingent upon meeting requirements for service, XRP price and XRP
trading volume. The remaining ████████ XRP was fully vested in 2018."[125]

72.   In the second quarter of 2019, Ripple entered another agreement whereby it
would grant 250 million XRP to Ripple's CEO. The XRP was "transferred to [Ripple's] CEO at
the time of the grant. Of this amount, 50% vested immediately upon grant with the remainder
subject to forfeiture provision lapsing quarterly over the next 4 years."[126]

73.   These compensation packages resulted in employees, as part of their
compensation for their services, owning an asset (subject to various conditions such as vesting).
Unlike the private equity ownership contracts, the compensation contracts do not give the
employees any contractual right to a share of Ripple's profits if Ripple is successful in its

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[122] *See, e.g.*, Complaint, at ¶¶ 127-130.

[123] Ripple, *Employment Offer Letter*, May 9, 2018 (RPLI_SEC 0431814, at 814).

[124] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2019 (RPLI_SEC 0301113, at 154).

[125] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2019 (RPLI_SEC 0301113, at 154-155).

[126] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2019 (RPLI_SEC 0301113, at 155).

ongoing efforts to manage and develop its business operations or impose any obligation on

Ripple to expend ongoing efforts to increase the price of XRP.

x.   *Miscellaneous Contracts*

a.   *Joint Ventures and Equity Investments*

74.   The Complaint also discuss Ripple's joint venture contract[127] and their other

equity investments in third-party entities.[128] Specifically, Ripple and SBI Holdings have entered

into a Joint Venture Agreement dated March 30, 2016 to establish, develop, and operate Ripple's

expansion in Asia.[129]As part of the contract, Ripple agreed to purchased 40% of the common

stock in a newly created entity, SBI Ripple Asia Co., Ltd. SBI Holdings retained the remaining

60% of the common stock.[130] In May 2016 Ripple invested ██████████ for 40% of the

outstanding stock of SBI Ripple Asia Kabushiki Kaisha.[131]

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[127] *See, e.g.*, Complaint, at ¶ 274 ("In its 2016 'Year In Review' summary, posted on its website on December 28, 2016, Ripple reminded readers of its January 2016 announcement of a joint venture to distribute 'Ripple's solutions' in certain countries.").

[128] *See, e.g.*, Complaint, at ¶¶ 279-280 ("On April 11, 2018, Ripple tweeted from the handle @Ripple that it 'had invested $25 million in XRP to Blockchain Capital Parallel IV, LP' to 'support and develop additional [XRP] use cases beyond payments.'")

[129] The joint venture gave SBI Holdings right of "exclusive distributor" of Ripple products in Asia, defined as "Japan, China (including Hong Kong), Taiwan, Korea, and ASEAN countries (excluding Singapore)." SBI Holdings, Inc. and Ripple Labs, Inc., *Joint Venture Agreement*, March 30, 2016 (RPLI_SEC 0163289, at 292).

[130] SBI Holdings, Inc. and Ripple Labs, Inc., *Joint Venture Agreement*, March 30, 2016 (RPLI_SEC 0163289, at 291). *See also*, Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2020, at 24.

[131] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2020, at 24.

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75.   In return for the right to "sublicense the Ripple technology, Ripple would receive a 15% royalty on any license fees charged to customers of the joint venture."[132] The agreement may be terminated upon mutual written agreement of the parties.[133]

76.   In January 2017, Ripple and the joint venture entity, ███, entered a statement-of-work that describes the "tasks and responsibilities to be executed by Ripple to support ███ ███████ for their needs to become self-sufficient in sales [and] product delivery … [to] implement … a cross-border payment services using the Ripple Solution."[134] ███ markets, licenses, and sells Ripple's software licenses and services in Asia.[135]

77.   On October 1, 2017, Ripple entered into a contract with a venture capital fund, Blockchain Capital Parallel IV, L.P., to invest in early-stage to growth venture companies that are developing blockchain-based technologies.[136] Ripple invested XRP in the fund and in turn, Ripple shared the profits (and losses) with the other partners of Blockchain Capital Parallel IV.

78.   Unlike the private equity ownership contracts, these contracts do not provide the joint venture or Blockchain Capital Parallel IV, L.P. with an XRP contractual right to a share of Ripple's profits if Ripple is successful in its ongoing efforts to manage and develop its business

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[132] Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2020, at 24.

[133] SBI Holdings, Inc. and Ripple Labs, Inc., *Joint Venture Agreement*, March 30, 2016 (RPLI_SEC 0163289, at 301). *See also*, SBI Holdings Inc., *Share Purchase Agreement*, May 27, 2016 (RPLI_SEC 0357972, at 975).

[134] Ripple Solutions Support, *Statement of Work for SBI Ripple Asia in support of Clients*, February 2017 (RPLI_SEC 0890252, at 255). Ripple support per the Statement of Work includes marketing and product sales, project management, software development, and training.

[135] ███████████, *Master Reseller Agreement*, September 24, 2018 (RPLI_SEC 0874207, at 207) and ████████ ███, *Marketing Incentive Agreement*, September 24, 2018 (RPLI_SEC 0246681, at 681).

[136] Blockchain Capital Parallel IV, LP, *Limited Partnership Agreement*, October 1, 2017 (RPLI_SEC 0272694, at 698).

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operations or impose any obligation on Ripple to expend ongoing efforts to increase the price of XRP.

b. *Option Contracts*

79.   The Complaint also discusses Ripple's XRP Options.[137] For example, Ripple and R3 HoldCo LLC ("R3 HoldCo") entered into a contract, dated September 3, 2018, that gives R3 HoldCo the right to purchase specified amounts of XRP at a per unit price of ████ between September 3, 2018 and September 20, 2019. Ripple grants R3 HoldCo the right to purchase up to ████████ units of XRP, in whole or in part, at any time during the exercise period, and up to an additional ████████ units of XRP based on specified increments and timing, subject to the terms of the contract.[138] In other words, the option constituted an option to buy an asset (XRP), rather than an option to buy a contractual right (such as stock or debt) to profits generated by Ripple if it were successful in managing and developing its business.

80.   Unlike the private equity ownership contracts, options are not associated with contractual rights to a share of Ripple's profits if Ripple is successful in its ongoing efforts to manage and develop its business operations or impose any obligation on Ripple to expend ongoing efforts to increase the price of XRP.

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[137] *See, e.g.*, Complaint, at ¶ 151 ("From January 2018 through December 2019, Ripple sold at least 1.65 billion XRP with certain entities exercised options to buy XRP that Ripple had granted (the 'Option Sales').").

[138] R3 HoldCo and XRP II, *Amended and Restated Option to Purchase XRP*, September 3, 2018 (RPLI_SEC 0863819, at 819) (R3 HoldCo is entitled "to purchase from the Company (i) up to ████████ ████████ XRP (the '*Unrestricted XRP*'), and (ii) up to ████████ ████████ XRP (the '*Restricted XRP*') (in each case, subject to the applicable provisions below).").

c.   *Charitable Donations (RippleWorks)*

81.   Finally, the Complaint discusses Ripple's distributions to RippleWorks.[139]

RippleWorks is a 501(c)(3) foundation that provides financial support for social ventures and

projects in Brazil, Mexico City, Ghana, Nigeria, and the U.S.[140] Unlike the private equity

ownership contracts, charitable donations are not associated with contractual rights to a share of

Ripple's profits if Ripple is successful in its ongoing efforts to manage and develop its business

operations or impose any obligation on Ripple to expend ongoing efforts to increase the price of

XRP.

III.   THE SEC'S ECONOMIC ASSERTIONS IN ARGUING FOR XRP'S "INVESTMENT CONTRACT" STATUS ARE FUNDAMENTALLY FLAWED

A.   ECONOMIC REALITY OF RIPPLE'S SECURITIES STANDS IN SHARP CONTRAST TO THAT OF THE ALLEGED INVESTMENT CONTRACTS

82.   As documented above, the economic substance of Ripple's private equity

ownership contracts stands in sharp contrast to the economic substance of the Ripple XRP

contracts. The former are funding mechanisms that enable Ripple to raise funds for its business

operations with the holders of these ownership stakes enjoying certain contractual rights to the

profits that Ripple might generate from its efforts in managing and developing its business

operations. None of Ripple's contracts for the distribution of XRP entitles the holder of XRP to a

share of Ripple's profits if Ripple is successful in its ongoing efforts to manage and develop its

business operations and none requires Ripple to expend ongoing efforts to increase XRP's price.

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[139] Complaint, at ¶ 281 ("At various times, Ripple publicly touted that it was making certain of the XRP distributions through xPring or RippleWorks, further making clear to potential investors that Ripple was enlisting the efforts of persons other than investors with respect to XRP.").

[140] "We are on a mission to help impactful ventures thrive," https://www.rippleworks.org/. "Our Story," https://www.rippleworks.org/our-story/.

The fact that Ripple may have used the proceeds of its sales of XRP to help fund its own operations does not change the economic substance of the transaction or create any obligations on the part of Ripple to share its profits with the purchasers of XRP. Moreover, as I show below, Ripple's XRP distributions do not have a statistically significant relation with long-run XRP price return after controlling for returns of other non-XRP cryptocurrencies outside of Ripple's control.

83.   The SEC's claim that the "economic reality" establishes that XRP is an "investment contract" because market actors "speculated" on XRP's price and, moreover, that Ripple's efforts impacted XRP's price is equally mistaken. As I will show in Section III.B, the asserted "speculative" nature of XRP fails to further the SEC's "economic reality" argument concerning XRP. Rather, as I will show in Sections III.C and D, the economic reality is that XRP's long-run price returns are in fact associated with factors outside Ripple's control, namely, price returns of non-XRP cryptocurrencies, and that the XRP price returns are unrelated to factors under Ripple's control, including the various distributions of XRP mentioned in the SEC's Complaint.

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B.   SPECULATIVE DEMAND IS NOT UNIQUE TO INVESTMENT CONTRACTS

84.   The SEC's affirmative theory for why XRP should be deemed an "investment contract" extensively relies upon the characterization of XRP as a "speculative" investment and that speculative demand would allegedly cause XRP's price to rise.[141],[142]

85.   Economists have long recognized that speculative demand is widespread among assets that are not securities, including money, foreign currencies, commodities, and virtual currencies. Participation by speculators is anything but unique to securities markets.

86.   For example, speculators in foreign currency markets routinely hope to profit from fluctuations in the market.[143] Hasselgren et al. (2020) demonstrate the importance of speculators in the foreign exchange ("FX") market by analyzing the U.S. Commodity Futures Trading Commission ("CFTC") Commitment of Traders reports, which are typically used to measure "speculative capital in the currency market."[144] Schreiber (2014) and Burnside (2007) similarly comment on the presence of speculators in FX markets, concluding that "speculators

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[141] *See, e.g.*, Complaint, at ¶ 232 ("[P]rincipal reason for anyone to buy XRP was to speculate on it as an investment*.*"). *See also*, Complaint, at ¶ 66 ("Ripple began its efforts by attempting to increase speculative demand and trading volume for XRP…"); at ¶ 69 ("Ripple made it part of its 'strategy' to sell XRP to as many speculative investors as possible."); at ¶ 105 (Ripple sold XRP to "institutional and other accredited investors who are purchasing XRP for speculative purposes."); at ¶ 235 ("[I]n its application to the NYDFS for XRP II in 2016, Ripple acknowledged that buyers were purchasing XRP for speculative purposes."); at ¶ 278 ("Pressed about 'speculation' in the digital asset space and XRP investor 'expectations' from Ripple, Garlinghouse explained: … there's going to be demand for that, when you have fixed supply, … and you see increase in demand, prices go up."); at ¶ 396 ("Ripple promoted XRP as a speculative investment when either no use case existed or, with the eventual development of the ODL product, only a small fraction of XRP arguable was being used for a few moments for non-investment purposes before being sold to investors.").

[142] I am not expressing an opinion or providing an assessment of whether or not XRP is a speculative investment.

[143] Osler, C., "Macro Lessons From Microstructure," *International Journal of Finance and Economics*, Vol. 11, 55-80, 2006 (Characterizing currency speculator as "a player who focuses on change in exchange rates, in contrast to a player, such as an exporter or importer, whose activity is based on transaction needs.").

[144] Hasselgren, A., J. Peltomaki, and M. Graham, "Speculator activity and the cross-asset predictability of FX returns," *International Review of Financial Analysis*, Vol. 72, 2020, at 2 and 15.

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have a major influence on FX markets"[145] and that the carry trading is "a currency speculation

strategy that is widely used by practitioners."[146]

      87.   Speculative activity is also well-documented in commodities and commodity

futures markets. Harris (2003) observes that futures on "agricultural, industrial, and financial

commodities are extremely useful to hedgers throughout the economy … [but] also interest many

speculators. … Trading by hedgers and speculators, and trading among the dealers who serve

them, generate very large volumes in many futures markets."[147] Smith (2009) studies the role of

speculators in the oil market.[148] Yang and Leatham (1999) show that speculators could also

improve the amount of information reflected in commodity futures prices.[149]

      88.   Speculators also play an active role in virtual currencies. Lee et al. (2020)

analyzes the differences in the objectives of speculators and tech-savvy investors in Bitcoin. Lee

et al. (2020) explain that speculators in Bitcoin seek to profit from extrapolating the price trends,

while tech-savvy investors trade based on the "prospective value of Bitcoin, which is a function

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[145] Schreiber, B., "Identifying Speculators in the FX Market: A Microstructure Approach," *Journal of Economics and Business*, Vol. 73, 97-119, May-June 2014, at 98.

[146] Burnside, C., M. Eichenbaum, and S. Rebelo, "The Returns to Currency Speculation in Emerging Markets," *American Economic Review*, Vol. 97, 333-338, May 2007, at 333.

[147] Harris, L., Trading & Exchanges: Market Microstructure for Practitioners, Oxford University Press, 2003, at 46. *See also*, Hull, J., Options, Futures, and Other Derivatives, 10th edition, 2017, at 19 ("The success of derivatives can be attributed to their versatility. They can be used by hedgers, speculators, and arbitrageurs."); Madura, J., Financial Markets and Institutions, 12th edition, 2016, at 351 ("Derivatives are financial contracts whose values are derived from the values of underlying assets. They are widely used to speculate on future expectations.").

[148] Smith, J., "World Oil: Market or Mayhem?" *Journal of Economic Perspectives*, Vol. 23, Number 3, 145-164, Summer 2009; Knittel, C., and R. Pindyck, "The Simple Economics of Commodity Price Speculation," *American Economic Journal: Macroeconomics*, Vol. 8:2, 85-110, April 2016.

[149] Yang J., and D. Leatham., "Price Discovery in Wheat Futures Markets," J*ournal of Agricultural and Applied Economics,* Vol. 31 (2), August 1999, 359-370, at 361.

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of factors that capture the market demand and technical supply of Bitcoin."[150] According to Bolt

and van Oordt (2019), speculators are prevalent holders of virtual currencies specifically

observing that the high volatility of Bitcoin prices indicates sensitivity to changes in speculators'

beliefs in the early-adoption phase of a virtual currency.[151]

89.   As these examples illustrate, the economic substance of foreign currencies,

commodities, commodity futures, and virtual currencies is not transformed into a "security"

simply by virtue of the fact that market participants speculate on the price movements of these

assets and may seek to earn a profit from doing so. The SEC's characterization of XRP as a

"speculative" investment leads nowhere – there is speculative demand for many assets that are

not "investment contracts."

C.   VARIATION IN LONG-RUN XRP PRICE RETURN IS EXPLAINED BY FACTORS OUTSIDE OF RIPPLE'S CONTROL

90.   The SEC alleges that Ripple distributed XRP to create profits for themselves and

the purchasers "in the form of increased *prices* for XRP."[152] The SEC fails to consider possible

alternative explanations for the economic reality that Ripple's efforts do not impact XRP prices.

Below, I assess whether XRP price return can be explained by factors that are outside the control

of Ripple's alleged efforts, such as the price return of equities, commodities, currencies, or other

non-XRP cryptocurrencies. In my empirical analysis of long-run XRP price return, I find that:

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[150] Lee, A., M. Li, and H. Zheng, "Bitcoin: Speculative Asset or Innovative Technology?" *Journal of International Financial Markets, Institutions & Money*, Vol. 67, 101-209, 2020, at 101.

[151] Bolt, W., and M. van Oordt, "On the Value of Virtual Currencies," *Journal of Money, Credit and Banking*, Vol. 52(4), 835-862, 2019, at 836.

[152] Complaint, at ¶ 90 (emphasis added). *See also*, Complaint, at ¶ 60 (SEC alleges that "Ripple and Larsen embarked on a large-scale unregistered public distribution of XRP and – with the goal of immense profits.").

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- Variation in long-run XRP price return can be explained by exogenous cryptocurrency market factors that are outside Ripple's control.

- Non-cryptocurrency assets (*e.g.*, equities) are not correlated with XRP price return, controlling for cryptocurrency market factors.

- On average, XRP price returns are not statistically different than zero, controlling for cryptocurrency market factors, over which Ripple has no control.

In the next section, I also analyze whether Ripple's alleged efforts – in particular, the various distributions of XRP – explain the variation in long-run XRP price return.

> i. *Variation in Long-run XRP Price Return Can Be Explained by Exogeneous Cryptocurrency Market Factors That Are Outside of Ripple's Control*

91.   I empirically examine the long-run relation between XRP price return (the "dependent variable") and various factors, such as cryptocurrency returns, equity returns and commodity returns (the "explanatory variables"), using a well-established framework in finance often referred to as a "factor model." Factor models are supported by more than 50 years of rigorous, academic research.[153] Factor models are used to determine the factors that explain the common component of the variation in asset price returns. Some of the original factor models were applied to equities, but the same framework has since been applied successfully to other types of assets, including fiat currencies, commodities, bonds, and cryptocurrencies.[154]

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[153] *See, e.g.*, Sharpe, W., "Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk," *The Journal of Finance*, Vol. 19(3), 1964; Fama, E., and K. French, "Common Risk Factors in The Returns on Stocks and Bonds," *Journal of Financial Economics*, Vol. 33, 3-56, 1993; Fama, E., and K. French, "Dissecting Anomalies with a Five-Factor Model," *The Review of Financial Studies*, Vol. 29, 69-103, 2016.

[154] *See, e.g.*, Lustig, H., N. Roussanov, and A. Verdelhan, "Common Risk Factors in Currency Markets," *Review of Financial Studies*, Vol. 24(11), 2011; Szymanowska, M., F. De Roon, T. Nijman, and R. Van Den Goorbergh, "An Anatomy of Commodity Futures Risk Premia," *The Journal of Finance*, Vol. 69(1), 2014; Bai, J., T. G. Bali, and Q. Wen, "Common Risk Factors in the Cross-Section of Corporate Bond Returns," *Journal of Financial Economics*, Vol. 131, 2019; Liu, Y, and A. Tsyvinski, "Risks and Returns of Cryptocurrency," *The Review of Financial Studies*, Vol. 34 (6), 2021.

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92.   There is no consensus in the literature on the nature or the number of factors that should be used. For example, the capital asset pricing model ("CAPM") uses a single factor, the market return (typically a market index), to assess whether an asset's return co-moves with the return of the market.[155] Additional factors have since been proposed, such as the Fama-French three-factor, five-factor, and multifactor models.[156] In fact, more than 300 factors have been proposed in the academic literature to date.[157]

93.   Many, but not all, factor models include market indices as factors. Such indices are readily available for traditional assets, such as stocks, commodities, or currencies (see below), but not for the cryptocurrency market. I, therefore, construct cryptocurrency factors by employing a well-established mathematical method known as Principal Component Analysis ("PCA").[158] The PCA can be used to distill and summarize the price variation in the cryptocurrency market into a small set of factors by identifying the most "important" components – meaning that these components capture most of the variance in price returns.[159] The principal components ("PCs") are constructed from the price returns of non-XRP cryptocurrencies. Each PC represents a specific combination of non-XRP cryptocurrencies,

[155] Sharpe, W., "Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk," *The Journal of Finance*, Vol. 19 (3), 425-442, September 1964*;* Ross, S., "The Current Status of the Capital Asset Pricing Model (CAPM)," *The Journal of Finance*, Vol. 33 (3), 885-901, June 1978.

[156] Fama, E., and K. French, "The Cross-Section of Expected Stock Returns," *The Journal of Finance*, Vol. 47 (2), June 1992; Fama, E., and K. French, "Dissecting anomalies with a Five-Factor Model," *The Review of Financial Studies*, Vol. 29 (1), 2015; Fama, E., and K. French, "Multifactor Explanations of Asset Pricing Anomalies," *The Journal of Finance*, Vol. 51 (1), March 1996.

[157] *See, e.g.*, Harvey, C., Y. Liu, and H. Zhu, "… and the Cross-Section of Expected Returns," *The Review of Financial Studies*, Vol. 29 (1), 5-68, January 2016, at 8 ("We choose a subset of papers that we suspect are in review at top journals, have been presented at top conferences, or are due to be presented at top conferences. … We catalogue 316 different factors.").

[158] *See, e.g.*, Stock, J., and M. Watson, Introduction to Econometrics, 4th Edition, 2019, Pearson, NY, at 490-495. Jolliffe, I., Principal Component Analysis, 2nd Edition, 2002, Springer, NY, at 1-9.

[159] Stock, J., and M. Watson, Introduction to Econometrics, 4th Edition, 2019, Pearson, NY, at 490-495.

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where the weights the procedure assigns to each of these cryptocurrencies are unique to a

particular PC. The PCA provides an ordered set of PCs based on how much the particular PC –

or, rather, the weighted sum of the *non-XRP* cryptocurrency returns comprising the PC –

contributes to explaining the variation in all the underlying cryptocurrency price returns. For

example, as I show in Exhibit 2, when examining the price returns of 9 non-XRP

cryptocurrencies between August 2013 and December 2020, and 91 non-XRP cryptocurrencies

between August 2015 and December 2020, merely four PCs explain, respectively 94% and 98%,

of the variance in the price return of the underlying non-XRP-cryptocurrencies. In turn, each of

the four PCs is comprised of a unique, weighted sum of the non-XRP cryptocurrencies.

94.   Principal Component Analysis has been extensively used in empirical, academic

research, including in the analysis of cryptocurrencies. For example, Hu et al. (2019) analyzed

the relation between Bitcoin and other coins using a principal component analysis.[160] Liew et al.

(2019) show that "more than one principal component explains the cross-sectional variation of

cryptocurrency returns."[161] I discuss these papers in more detail in the next section.

95.   I use PCA to construct the non-XRP cryptocurrency market factors and then use

the PCs in a linear regression model to analyze the relation between XRP price return and the

price returns of other cryptocurrencies. For the non-XRP cryptocurrencies, I select only

cryptocurrencies with available price from August 6, 2013 to December 20, 2020[162] and analyze

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[160] Hu, A., C. Parlour, and U. Rajan, "Cryptocurrencies: Stylized facts on a new investible instrument," *Financial Management*, 2019, at 1061-1062.

[161] Liew, J., R. Li, T. Budavári, and A. Sharma, "Cryptocurrency Investing Examined," *The Journal of the British Blockchain Association*, Vol. 2(2), 2019, at 1 and 6.

[162] For analysis focused on the estimation period August 11, 2015 - December 20, 2020, I use cryptocurrencies with available price information during that period and further restrict the data sample to coins that have a market cap of at least $100,000 in either August 2015 or December 2020 (or both) to avoid using small cryptocurrencies with less informative price information.

the 28-day price return (hereafter, the "monthly price return") for these coins.[163] By examining

returns at a monthly frequency over a long period of time (between five and seven years,

depending on the specification), I am able to reduce the effect of any short-lived movements in

the cryptocurrency market and assess the long-run, common factors that explain variation in

XRP prices.[164] I discuss the data I use in my empirical analysis in more detail in Appendix C.

96.   To analyze the relation between XRP return and return of other cryptocurrencies,

I estimate linear regression models where the PCs represent the non-XRP cryptocurrency factors:

$$(XRP\_return - risk\text{-}free\ rate)_t = a + b_1 {*} PC\_1_t + b_2 {*} PC\_2_t + \ldots + b_k {*} PC\_k_t + \varepsilon_t$$

where the dependent variable is XRP price return less the risk-free rate during the 28-day period

t, a is a constant term, PC_1 thru PC_k denotes k principal components (each representing a

combination of non-XRP cryptocurrencies price return subtracting the risk-free rate), and ε

denotes the error term.[165] The error term captures the difference between the dependent variable

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[163] Specifically, I define the 28-day price return as: *Price (day t+28) / Price (day t) – 1*, with prices measured at midnight UTC. I use a 28-day interval rather than a calendar month and always start the 28-day period on a Tuesday to address several potential concerns. First, this ensures all periods are of equal length (28 days). Second, it allows me to analyze XRP starting in mid-August 2013, when XRP first starts trading on a public exchange. Third, I circumvent any concerns that trading on weekends is of lower volume and of a somewhat different nature, as each period will end on a Tuesday. I use Tuesday rather than Monday to reduce the number of U.S. holidays.

[164] Note that both the original and recent factor models by Fama and French are at the monthly frequency. *See, e.g.*, Fama, E., and K. French, "Dissecting Anomalies with a Five-Factor Model," *The Review of Financial Studies*, Vol. 29 (1), 2015, p. 73 ("Our sample is the 618 months from July 1963 to December 2014 (henceforth 1963–2014). The average monthly returns []"). Liu and Tsyvinski (2021) analyze the relation between cryptocurrency returns and various factors at the monthly frequency. *See* Liu, Y., and A. Tsyvinski, "Risks and Returns of Cryptocurrency," *The Review of Financial Studies*, Vol. 34, Issue 6, June 2021, at Tables 2, 3, 4, 5, 13, and 14.

[165] I use the one-month U.S. Treasury bill rate as the risk-free rate. *See* Appendix C for further detail.

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(XRP price return) and XRP price return estimated using the regression model.[166] The academic

literature often refers to the coefficients b_1 though b_k as "betas."[167]

I can rewrite the regression equation as:[168]

$$(XRP\_return - risk\text{-}free\ rate)_t - \sum_k b_k * PC_{k,t} = a + \varepsilon_t$$

where the left-hand side can be interpreted as the XRP price return adjusted for the non-XRP

cryptocurrency market factors. The right-hand side of the equation includes a constant term, *a,*

that represents the "remaining" average return, after accounting for the exposure to the non-XRP

cryptocurrency market factors.

97.   Exhibit 3 shows results for the factor model for two estimation periods: August 6,

2013 – December 15, 2020 ("Estimation Period 1") and August 11, 2015 – December 20, 2020

("Estimation Period 2"). August 6, 2013, the first date in Estimation Period 1, is the Tuesday

when XRP prices are available at cryptocurrency exchanges. August 11, 2015, the first date in

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[166] *See, e.g.*, Kaye, D., and D. A. Freedman, "Reference Guide on Statistics," <u>Reference Manual on Scientific Evidence</u>, 3rd Edition, The National Academies Press, Washington DC, 211-302, 2011, at 281-282 ("[T]he difference between the estimated value and the true value is due to the action of the error term ε … Without ε, observed values would line up perfectly with expected values, and estimated values for parameters would be exactly equal to true values. This does not happen.").

[167] *See, e.g.*, Cochrane, J., <u>Asset Pricing</u>, revised edition, 2005, at 16 ("This is *a beta pricing model*. It says that each expected return should be proportional to the regression coefficient, or beta, in a regression of that return on [factors].").

[168] Note that, while asset pricing models are often interested in price returns for portfolios, here the focus is on only a single asset, XRP, and the average variation in its price returns over the estimation period.

Estimation Period 2, is the first Tuesday after Ethereum (ETH) started trading. Both estimation

periods end on or prior to December 20, 2020.[169,170]

98.   The results of Exhibit 3 show that, in both estimation periods, the principal

components representing the non-XRP cryptocurrency price returns have a statistically

significant relationship with XRP price return.[171] For example, in Estimation Period 1, the

coefficients on two (of the four) PCs are statistically significant at the 5% level.[172] In Estimation

Period 2, the coefficients on 9 (of the 11) PCs are statistically significant at the 5% level.[173]

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[169] I use December 20, 2020 as the end date of my analysis period to avoid potential price effects following the SEC's complaint. The anticipation of the SEC's complaint was made public on December 21, 2020 (*See, e.g.*, Roberts, J., "Ripple says it will be sued by the SEC, in what the company calls a parting shot at the crypto industry," *Fortune,* December 21, 2020, https://fortune.com/2020/12/21/ripple-to-be-sued-by-sec-cryptocurrency-xrp/), and the initial complaint was filed on December 22, 2020.

[170] I use 28-day periods for Estimation Period 1 ending on December 15, 2020. The last monthly period in Estimation Period 2 has only 26 days (ending on December 20, 2020). I adjust the returns for this 26-day period to make them comparable to all the other 28-day periods.

[171] The PCA generates as many PCs as there are underlying coins. For each specification, I calculate the Bayesian information criterion (BIC) as $BIC = -2 \times ln(L) + ln(N) \times k$, where L, N and k are the estimated likelihood, number of observations, and number of parameters, respectively. I report the results for the specification for which the BIC is the lowest to the extent that any additional PC added to the model would only result in a small decrease (a decrease of less than 2 units) in the BIC criterion. *See, e.g.*, Kass, R., and A. Raftery, "Bayes Factors," *Journal of the American Statistical Association*, Vol. 90(430), 773-795, June 1995, at 777. *See also* Stock, J., and M. Watson, "Macroeconomic Forecasting Using Diffusion Indexes," *Journal of Business & Economic Statistics*, Vol. 20 (2), 147-162, 2002; and in the asset pricing setting, Ludvigson, S., and S. Ng, "The Empirical Risk-Return Relation: A Factor Analysis Approach," *Journal of Financial Economics*, Vol. 83 (1), 171-222, 2007, at 8 ("the [factors] are estimated by principal components analysis … minimizing the BIC yields the preferred set of factors.").

[172] PCA constructs PCs that do not have a unique sign. One could multiply *all* PCs by negative one and obtain an equally valid PCA decomposition. But doing so would also result in all the PC coefficients in the regression reversing their sign. Therefore, when examining PC coefficients, I will focus only on their statistical significance, not the sign of the coefficient. However, regardless of the sign of the PCA decomposition, the economic interpretation of the results would be *identical*. For example, if a one percentage point increase in the price return of Bitcoin – one of the PCs' components – were associated with a one percentage point increase in the price return of XRP, that would be true regardless of the sign of the decomposition.

[173] A 5% statistically-significant (non-zero) relationship between XRP and the non-XRP cryptocurrency-based PCs means that there is less than a 5% chance that the estimated relationship is due to random chance. *See, e.g.*, Kaye, D., and D. Freedman, "Reference Guide on Statistics," Reference Manual on Scientific Evidence, 3rd Edition, 2011, The National Academies Press, Washington DC, 211-302, at 250 ("The discrepancy between the observed and the expected is far too large to explain by random chance."). *See also*, at 251-252 ("In practice, statistical analysts typically use levels of 5% and 1%. The 5% level is the most common in social science … An

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Moreover, the adjusted R-squared shows that more than half of the variation in the long-run XRP price return can be explained by other, non-XRP cryptocurrencies.[174] The adjusted R-squared in Estimation Period 1, which includes a period when the cryptocurrency markets were arguably less mature,[175] exceeds 50%. The adjusted R-squared in Estimation Period 2 exceeds 90%.

99.　　　Exhibit 4 shows the top 20 non-XRP cryptocurrencies by market capitalization as of August 11, 2015 (the start date of Estimation Period 2) that were used in the PCA. Bitcoin, Litecoin, and Ethereum have the highest market capitalization in this sample of coins. Bitcoin and Litecoin were also included as underlying cryptocurrencies for the analysis over Estimation Period 1. I also implemented a regression model directly using the largest cryptocurrencies (as measured by market cap) as my independent variables. Exhibit 5 shows the results of this regression, and it demonstrates that the importance of the underlying cryptocurrencies in explaining variation in XRP price return hold even if I make no use of the PCA. In both estimation periods, the coefficient for at least one cryptocurrency is statistically significant at the 5% level. The R-squared is again more than 50% in Estimation Period 1 and more than 90% in

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unexplained reference to highly significant results probably means that [the probability or rejecting the null hypothesis] is less than 1%. These levels of 5% and 1% have become icons of science and the legal process.").

[174] The R-squared measures the percentage of the variation in the dependent variable (*e.g.*, XRP price return) that the regression model explains. *See, e.g.*, Kaye, D., and D. A. Freedman, "Reference Guide on Statistics," <u>Reference Manual on Scientific Evidence</u>, 3rd Edition, 2011, The National Academies Press, Washington DC, 211-302, at 293 ("*R-squared (R^2)*. Measures how well a regression equation fits the data. R-squared varies between 0 [0%] (no fit) and 1 [100%] (perfect fit).").

[175] Liu, Y., and A. Tsyvinski, "Risks and Returns of Cryptocurrency," *The Review of Financial Studies*, Vol. 34 (6), 2689-2727, June 2021, at 2719 (commenting that there were "considerably more uncertainty and learning about cryptocurrency as an asset class" during the early period and that "uncertainty has decreased" over time). Pastor and Veronesi (2003) explained that it takes time for "investors to fully learn and understand emerging technologies." *See* Pastor, L., and P. Veronesi, "Stock Valuation and Learning about Profitability," *The Journal of Finance*, Vol. 68 (5), 1749-1789, October 2003; Makarov, I., and A. Schoar, "Trading and arbitrage in cryptocurrency markets," *Journal of Financial Economics*, Vol. 135 (2), 293-319, 2020, at 296 (The authors analyze trading at global, cryptocurrency exchanges and comment that prior to January 2017 the "[market] liquidity in crypto markets was significantly lower than in later periods.").

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Estimation Period 2, similar to what I found when using the PC (*see* Exhibit 3). These results are not surprising given that the PCA is merely a representation of the underlying cryptocurrencies.

100.   In summary, my empirical analyses show that the variation in long-run price return of XRP can be explained by exogenous, non-XRP, cryptocurrency price returns or, put differently, by factors outside Ripple's control.

  ii. *Non-cryptocurrency Assets Are Not Correlated with XRP Price Return Controlling for Cryptocurrency Market Factors*

101.   I next examine the role that other traditional assets play in explaining XRP price return. Overall, I find that other assets have little to no additional explanatory power beyond that of the cryptocurrency factors.[176] Specifically, I add the returns (less the risk-free rate) for 1) S&P500; 2) MCSI World Index and MCSCI Emerging Market Index; 3) Bloomberg Commodity Index; 4) Gold; and 5) U.S. Dollar Index (USDX), Japanese Yen, and Euro as factors.[177] Adding these returns produces a total of 10 specifications. As I show in Exhibits 6 and 7, none of the coefficients for the non-cryptocurrency assets is statistically significant at the 5% level. The adjusted R-squared for each of the estimation periods are similar, when compared to the base case of only controlling for cryptocurrency factors (column (1) in each of the two exhibits). This means that returns on the traditional assets I examined do not explain any meaningful amount of the variation in XRP price return controlling for non-XRP cryptocurrency factors. As I discuss below, my findings are consistent with the academic literature that finds

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[176] Note that not all explanatory variables need to be PCs, as is the case in these Exhibits. *See, e.g.*, Ludvigson, S., and S. Ng, "The empirical risk–return relation: A factor analysis approach," *Journal of Financial Economics*, Vol. 83(1), 171-222, 2007, Table 2 ("Regressions of Quarterly Excess Returns on … Variables [consumption-wealth, realized volatility, etc.] and Factors [obtained via PCA]").

[177] These returns are constructed similarly to the cryptocurrency price returns. I examine the 28-day returns of the indices (*e.g.*, S&P 500) and prices (*e.g.*, gold). *See* Appendix C for more detail on these measures.

little to no explanatory power for non-cryptocurrency returns when examining cryptocurrency

returns.

   iii.   *Average XRP Price Returns Are Not Statistically Different Than Zero When*
         Controlling for Factors Outside Ripple's Control

   102.   The factor models and the corresponding results I present in Exhibits 3 through 7

allow me to examine whether, on average, there are additional XRP price returns after

controlling for other non-XRP cryptocurrency market factors. Across all the specifications, I find

that XRP price returns (after subtracting the risk-free rate) are not statistically significantly

different than zero controlling for non-XRP cryptocurrency market factors. In each of the

Exhibits, 3-7, in all columns, none of the constants – which are estimates of the average monthly

XRP price return after subtracting the risk-free rate and controlling for non-XRP cryptocurrency

factors – is statistically significant at the 5% level. In other words, one cannot reject the null

hypothesis that the constant – the observed average monthly XRP price return after subtracting

the risk-free rate – is zero (controlling for non-XRP cryptocurrency market factors). As I explain

above, a zero regression constant is consistent with the average monthly Ripple price returns

(less the risk-free rate) being explained by the non-XRP cryptocurrency factors and no remaining

average "excess" XRP price returns that are unexplained by the model.[178]

   103.   Taken together, the results discussed in subsections III.C.i-iii and presented in

Exhibits 3-7 demonstrate that the variation in long-run XRP price return can be explained by

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[178] If the null hypothesis of the constant term equals zero are rejected (which is not the case in Exhibits 3-7), that
   would merely mean that the factors used in the model were insufficient to explain the average monthly XRP
   price return and that there were potentially additional factors that needed to be included. A rejection of the null
   of a zero constant term *cannot* be used to learn the nature or identify of the additional factors that should be
   added to the model and whether those factors are related to the cryptocurrency market, other asset markets,
   political sentiment, changes to regulation, *etc. See, e.g.*, an extensive discussion of a wide range of potentially
   relevant factors in Liu, Y., and A. Tsyvinski, "Risks and Returns of Cryptocurrency," *The Review of Financial
   Studies*, Vol. 34 (6), 2689-2727, June 2021.

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non-XRP cryptocurrency market factors that are outside of Ripple's control, and that various

measures of traditional assets do not have a statistically significant relationship with XRP price

returns.[179]

    iv.   *The XRP Factor Model Results Are Consistent with the Findings in the Academic Literature Along Several Dimensions Including the Role of Cryptocurrency-related Factors*

        104.   The results of the XRP price return factor model is further buttressed by academic

studies of cryptocurrency markets. Overall, these studies conclude that: 1) on average,

cryptocurrency prices can be explained by cryptocurrency-related factors; and 2) other assets,

such as commodities, equities, or currencies, do not have any explanatory power for

cryptocurrency returns. For example, Liu and Tsyvinski (2021) "establish that cryptocurrency

returns are driven and can be predicted by factors that are specific to cryptocurrency markets. …

[For] currencies, commodities, stocks, and macroeconomic factors … we find that the exposures

of cryptocurrencies to these traditional assets are low."[180] Both of these conclusions are

consistent with my findings that XRP price return can be explained by cryptocurrency factors

and *not* the returns of other assets. Similarly, Liu et al. (2021) implement a three-factor

cryptocurrency model, and their analysis shows that the expected cryptocurrency returns can be

explained by three cryptocurrency factors (market return, size, and momentum).[181]

        105.   Hu et al. (2019) analyzed the relation between Bitcoin and other coins using a

principal component analysis and showed that "the first principal component for monthly returns

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[179] I assess the effect of Ripple's alleged efforts on XRP price return in Section III.D.

[180] Liu, Y., and A. Tsyvinski, "Risks and Returns of Cryptocurrency," *The Review of Financial Studies*, Vol. 34(6), 2689-2727, June 2021, at 2689 and 2693.

[181] Liu, Y., A. Tsyvinski, and X. Wu, "Common Risk Factors in Cryptocurrency," *The Journal of Finance, Forthcoming*, 2021, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3379131.

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explains 31.7% of daily returns" and further that "beta of Bitcoin with respect to the S&P 500 or

gold is not significantly different from zero at the 10% level."[182] Liew et al. (2019) show that

"principal component[s] … explain the cross-sectional variation … of cryptocurrency

returns."[183] Liew et al. (2019) also show that Bitcoin return is not correlated with traditional asset

returns (S&P500 Index, US Dollar Index, MSCI World Index, Bloomberg Commodity Index,

VIX Index).

106.   In addition, the findings regarding XRP price returns are in line with studies in the

academic literature with regards to the amount of explained variation in price returns. For

example, Liu et al. (2021) examine various cryptocurrency factor models and find that, for

various cryptocurrency portfolios, the amount of explained variation in price returns is similar in

magnitude to the results presented above.[184] For example, for their (preferred) three-factor

model, they find that the average R-squared for their five quintile portfolios ranges from 17.2%

to 95.3% depending on the particular strategy.[185]

D.   CONTRARY TO THE SEC'S ASSERTIONS, RIPPLE'S ALLEGED EFFORTS TO DISTRIBUTE XRP DID NOT AFFECT THE LONG-RUN PRICE RETURNS OF XRP

107.   The SEC also points to various efforts by Ripple that purchasers of XRP allegedly

relied upon for an expectation of profit (in the form of increasing XRP's price).

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[182] Hu, A., C. Parlour, and U. Rajan, "Cryptocurrencies: Stylized Facts on A New Investible Instrument," *Financial Management*, 2019, at 1060-1061.

[183] Liew, J., R. Li, T. Budavári, and A. Sharma, "Cryptocurrency Investing Examined," *The Journal of the British Blockchain Association*, Vol. 48, 1049-1068, 2019, at 1049 and 1054.

[184] Liu, Y., A. Tsyvinski, and X. Wu, "Common Risk Factors in Cryptocurrency," *The Journal of Finance, Forthcoming*, 2021, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3379131.

[185] *See* Liu et al. (2021), Table 9, the 10 strategies denoted with (3).

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108. The SEC alleges that Ripple distributed XRP "with the goal of immense profits."[186] The SEC then points to the increase in the market price of XRP as evidence that "Ripple's planned distributions of XRP succeeded."[187] The SEC argues that Ripple distributed XRP to effectuate their "dual purpose of raising funds from their XRP sales and managing the liquidity of the XRP market."[188] The SEC, however, fails to recognize that Ripple's efforts to improve liquidity are not equivalent to efforts to increase prices. As I discuss below, there were Ripple efforts aimed at improving market liquidity for XRP to enhance the efficacy of Ripple's product suite, including ODL. Furthermore, my empirical analysis demonstrates that Ripple's XRP distributions did not have a statistically significant effect on XRP's long-run price returns.

i.   Ripple's XRP Distributions Did Not Increase XRP Price Return

109. Starting in 2013, Ripple distributed XRP to institutional investors, via the wholesale market, to market makers, to programmatic sellers at various cryptocurrency exchanges, and also to other parties. The first date the SEC alleges Ripple distributed XRP to wholesalers was in early 2013, and the first distribution to a market maker was in November 2014.[189] As of December 20, 2020, Ripple's aggregate distributions were approximately 25 billion XRP, and they were still holding approximately 55 billion of their original 80 billion XRP. The Founders, separately from Ripple, could also sell their original 20 billion XRP.

110. Exhibits 8 and 9 show the monthly distributions, that is, the monthly XRP outflows net of any potential inflows to Ripple, respectively in XRP and USD for the period

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[186] Complaint, at ¶ 60 ("In other words, Ripple and Larsen embarked on a large-scale unregistered public distribution of XRP and—with the goal of immense profits.").

[187] Complaint, at ¶¶ 79-82.

[188] Complaint, at ¶ 190.

[189] *See* RPLI_SEC 1100594 and RPLI_SEC 1100595.

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August 2013 through December 2020. The number of XRP units that were distributed varies by month, and the data shows monthly net outflows in most months.[190]

111.   Ripple publicly reports its XRP holdings on its website, which shows the total amounts of XRP held by Ripple and in Ripple's escrow.[191] Ripple's aggregate XRP distributions and the 20 billion XRP held or distributed by Larsen, McCaleb, and Britto are combined and reported as the "XRP Total Distribution." A widely-used website, CoinMarketCap, also reports circulating supply for XRP (and many other cryptocurrencies).[192] Exhibit 10 shows XRP circulating supply and the total XRP distributions. The circulating supply of approximately 45 billion XRP as of December 2020 includes the 20 billion XRP from the Founders and the 25 billion of aggregate XRP distributions from Ripple through this date.

112.   As a matter of basic economics, an increase in supply should, all else equal, lead to a *decrease*, not an increase, in price. In theory, the market equilibrium price of XRP occurs at the intersection of demand and supply. A net outflow from Ripple would increase supply, which, all else equal, would lead to *lower*, not higher prices.[193] In fact, as I discuss in more detail in Sections III.E and IV, Ripple distributed XRP to improve liquidity of the XRP market, making it more useful as a virtual currency in Ripple's products. Below, I also show that there is no statistically significant relation between Ripple's XRP distributions and the long-run price return of XRP controlling for cryptocurrency market factors.

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[190] The only two exceptions are August 2016 and June 2017, which show net inflows into Ripple.

[191] *See* "Market Performance, XRP Market Metrics," https://ripple.com/xrp/market-performance. An increase in the circulating supply also means that Ripple's holdings of XRP decrease over time.

[192] CoinMarketCap defined the circulating supply as "the best approximation of the number of assets that are circulating in the market and in the general public's hands." *See* CoinMarketCap, https://coinmarketcap.com/alexandria/glossary.

[193] Mankiw (2016) explains that an increase in supply, all else equal, would decrease, not increase prices. Mankiw, N., Principles of Economics, 8th edition, 2016, at 82 and Table 4.

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113.   To assess empirically whether there was a relation between Ripple's XRP distributions and the price return of XRP, I expand the factor model I discussed above to include two additional factors. First, I include Ripple's monthly distribution of XRP, which is the net outflows of XRP from Ripple over the last 28 days, and second, I include the one-month lagged XRP distribution to account for timing differences in XRP distributions.[194] By examining lag distributions, I allow for a delay in the effect of XRP distributions.

114.   The regression equation with the cryptocurrency market factors I discussed before and the two factors related to Ripple's distributions are:

$$(XRP\_return - risk\text{-}free\ rate)_t = a + b*Cryptocurrency\ Factors_t + c*D(t) + d*D(t\text{-}1) + \varepsilon_t$$

where the dependent variable is XRP price return less the risk-free rate during the 28-day period t; a is a constant term, the Cryptocurrency Factors are the PC_1 thru PC_k, $D(t)$ is Ripple's aggregate distributions over the 28-day period, $D(t\text{-}1)$ is Ripple's aggregate distributions over the preceding 28-day period, and ε denotes the error term.

115.   Exhibit 11.A presents results for this regression model for Estimation Period 1 (August 6, 2013 – December 20, 2020) and Exhibit 11.B presents results for this regression model for Estimation Period 2 (August 11, 2015 – December 20, 2020) to include the period after Ethereum (ETH) first started trading. The results show that Ripple's XRP distributions and lagged distributions do not have a statistically significant relation with XRP price return at the 5% level. As in the case of Exhibits 3-7, the cryptocurrency factors, as summarized by the principal components, are statistically significant at the 5% level and the regression constant term is not statistically significant at the 5% level. Therefore, Ripple's XRP distributions,

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[194] I consider net outflows of XRP from Ripple as Ripple's distributions. As I discussed in Section III some of the contracts governing the XRP distributions may have lockup periods which means that such XRP might have been held by these participants for a period of time after the distribution from Ripple.

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including lagged distributions, do not affect XRP's long-run return. Rather, the long-run XRP price return is explainable by non-XRP cryptocurrency market factors.

116.   I also present an alternative specification that considers the potential effects of the lagged XRP price return and the volatility of XRP prices in addition to the cryptocurrency market factors and Ripple's distributions.[195] Following the Griffin and Shams (2020) framework, my alternative specification includes the lagged XRP price return as an independent variable to control for the potential effects of return reversals.[196] I also include the lagged return interacted with the price volatility to control for the potential of larger reversals during periods of high volatility.[197]

117.   The alternative regression model decomposes XRP price return into cryptocurrency price return (captured by the PCs), Ripple's distributions, and the two Griffin and Shams (2020) factors. Exhibits 12.A and 12.B show the results for this specification for Estimation Periods 1 and 2. In the first column, I implement the Griffin and Shams' specification, which incorporates XRP price volatility and lagged XRP price returns. In the second and third columns, I also include the cryptocurrency market-related factors, using the PCA approach I discussed above. Throughout, the coefficient on distributions is not statistically significant at the 5% level, and the adjusted R-squared of the alternative specification is again

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[195] Griffin and Shams (2020) developed a framework to assess the effect of issuance of flows from stablecoin issuance on prices of Bitcoin. Griffin, J., and A. Shams, "Is Bitcoin Really Untethered?," *The Journal of Finance*, Vol. 75(4), August 2020. *See also*, Lyons, R., and G. Viswanath-Natraj, "What Keeps Stablecoins Stable?," *Working paper*, May 2020.

[196] Griffin and Shams (2020), at 1936. *See also*, Lehmann, B., "Fads, Martingales, and Market Efficiency," *Quarterly Journal of Economics*, Vol. 105(1), 1990.

[197] Griffin and Shams (2020), at 1936. *See also*, Nagel, S., "Evaporating Liquidity," *Review of Financial Studies*, Vol. 25(7), 2012.

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above 50% for Estimation Period 1 and above 90% for Estimation Period 2 when adding the

cryptocurrency market-related factors.

118.   My empirical analysis shows that Ripple's distributions of XRP do not have a

statistically significant relation with long-run XRP price return controlling for cryptocurrency

market factors. These results further reinforce my prior findings that the long-run XRP price

return is correlated with non-XRP cryptocurrency returns. Taken together, these findings

demonstrate that factors outside of Ripple's control – rather than Ripple's efforts (measured by

Ripple's distributions) – explain movements in long-run XRP price return. In other words,

XRP's long-run price returns are owing to non-XRP cryptocurrency market factors; none of

those returns is owing to the efforts of Ripple.

ii.   *Ripple's Distributions Including Distributions from the Escrow Account Did Not Increase XRP's Price Return*

119.   Ripple announced the creation of the Escrow in May 2017[198] and subsequently

transferred 55 billion XRP to the Escrow in December 2017.[199] Ripple can distribute up to 1

billion XRP from the Escrow per month, but decisions on the timing and amount of intra-month

XRP distributions are determined by Ripple.[200] The unused monthly remainder gets returned into

the Escrow for another 55 months. I analyzed the monthly net outflow of XRP from Ripple

divided by 1 billion XRP, the Escrow monthly limit. In the 12 months ending December 31,

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[198] Garlinghouse, B., "Ripple to Place 55 Billion XRP in Escrow to Ensure Certainty of Total XRP Supply," *Ripple Insights*, May 16, 2017, https://ripple.com/insights/ripple-to-place-55-billion-xrp-in-escrow-to-ensure-certainty-into-total-xrp-supply/.

[199] Garlinghouse, B., "Ripple Escrows 55 Billion XRP for Supply Predictability," *Ripple Insights*, December 7, 2017, https://ripple.com/insights/ripple-escrows-55-billion-xrp-for-supply-predictability/.

[200] "Bithomp," https://bithomp.com/explorer/r9NpyVfLfUG8hatuCCHKzosyDtKnBdsEN3. *See also*, "An On-Chain Analysis of Ripple's Escrow System," *Coin Metrics*, May 16, 2019, https://coinmetrics.io/an-on-chain-analysis-of-ripples-escrow-system/.

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2017, the monthly ratio ranged from -0.7% to 55.8% (22.3% on average). In the 12 months

ending December 31, 2018, the monthly ratio ranged from 2.1% to 55.9% (17% on average). On

average, the ratio is less than 100%, which shows that Ripple consistently distributed less than

one billion XRP. The cap on XRP distributions introduced by the Escrow is therefore not a

binding constraint on the amount that Ripple can distribute per month.

120.   Starting in December 2017, Ripple's XRP distributions also included distributions

from the Escrow. Ripple's XRP distributions, which included the distributions from the Escrow,

did not have a statistically significant effect on the XRP price return, as I demonstrated above.

> iii.   *Ripple's Distributions at Discounted Prices to Select Purchasers Were Economically Reasonable Compensation for Bearing Risk or Providing Services to Ripple*

121.   Ripple sold XRP to certain institutional investors at discounted prices, which the

SEC alleges "[leads] purchasers to reasonably expect to profit on their resale of XRP into the

public markets."[201] Ripple's provision of a price discount to institutional investors is

economically reasonable, and moreover customized to the respective purchaser, as I explain

below.

122.   For example, the June 2016 contract with ███████ specifies the sale of XRP at a

██% discount. The contract specifies a lockup period of ███████ followed by a restriction on the

amount of XRP that ██████ could sell following the lockup period.[202] During and following the

lockup period, ██████ was exposed to the risk that the value of the XRP holdings could

decrease. During the restricted sale period, the average daily price volatility of XRP over the

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[201] Complaint, at ¶ 355 and ¶ 107 ("Ripple made many of the XRP Institutional Sales at a discount from XRP market prices. At least seven of the institutional investors—including some described below—bought XRP at discounts between 4% and 30% to the market price."). *See also*, Complaint, at ¶¶ 114-117.

[202] ███████████████, *XRP Purchase Agreement*, June 9, 2016, at 2; ███████████████, *XRP Purchase Agreement*, June 23, 2016, at 2. *See also*, discussion in Section I of this report.

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holding period was between 4% and 5%. Ripple's discounted XRP sales price to ▮▮▮▮ is

consistent with ▮▮▮▮ exposure to volatility of XRP prices in the cryptocurrency markets.

123.   In another example, a December 28, 2015 contract with ▮▮▮▮ specifies

that Ripple sold XRP to ▮▮▮▮ discounted by ▮▮.[203] The contract also specifies that these

XRP cannot be sold or transferred during a ▮▮▮▮ lockup period starting on December 28,

2015 and ending ▮▮▮▮ later.[204] The average daily price volatility of XRP over the holding

period was 10%. Ripple's discounted XRP sale price to ▮▮▮▮ is therefore consistent with

exposure to XRP price volatility. Separately, Ripple engaged ▮▮▮▮ as a Global Brand

Ambassador to provide various services including serving as a liaison between major financial

institutions, developing Ripple's business (mostly in Europe), appearing and representing Ripple

at events, and serving on the Board of Ripple Luxembourg.[205]

    E.   RIPPLE'S EFFORTS TO FACILITATE THE GROWTH OF XRP MARKET LIQUIDITY ADVANCED RIPPLE'S STRATEGIC OBJECTIVE TO PROVIDE GLOBAL FINANCIAL SETTLEMENT SOLUTIONS

    i.   Market Liquidity and Trading Mechanisms

124.   One of the pillars of using XRP as a medium of exchange more generally but also

in cross-border remittances is the existence of a liquid market for XRP. My empirical results in

subsection C.i. show that Ripple's distributions did not have a statistically significant effect on

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[203] ▮▮▮▮, *Purchase Agreement with XRP II LLC*, December 28, 2015 (RPLI_SEC 0609642, at 642). ▮▮ ▮▮▮▮ did not pay Ripple for the XRP as of the purchase date but entered into a promissory note with Ripple on December 28, 2015 and pledged the purchased XRP as collateral. *See XRP Pledge Agreement and XRP Promissory Note with* ▮▮▮▮, December 28, 2015 (RPLI_SEC 0609645).

[204] ▮▮▮▮, *Purchase Agreement with XRP II LLC*, December 28, 2015 (RPLI_SEC 0609642, at 643) ("Transfer Restriction: Neither the Purchased XRP nor any interest herein may be sold, pledged or otherwise transferred to any person prior to the ▮▮▮▮ of the Date of Purchase (the 'Lockup Period') – unless that person also agrees not to re-sell or otherwise distribute the Purchased XRP to any other party during the Lockup Period.").

[205] *Brand Ambassador Services Term Sheet*, February 14, 2015 (RPLI_SEC 0895476, at 476) (as Global Ambassador, ▮▮▮▮ "shall provide the following services on a non-exclusive basis for [Ripple].").

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XRP's long-run price return. I explain next that Ripple's efforts over time were concerned with improving market liquidity for XRP in order to provide global financial settlement solutions.

125.   At first, Ripple focused their efforts on improving liquidity using several mechanisms on the XRP Ledger before also focusing on improving XRP liquidity at the off-ledger, cryptocurrency exchanges once such exchanges became a viable alternative, and also specifically at cryptocurrency exchanges that serve markets where the ODL transactions were occurring.[206] The existence of a liquid market for XRP is a critical component of the ODL platform.[207]

126.   Market liquidity is the ability to trade quickly in a market without having a large effect on the market price.[208] The mechanisms through which markets successfully achieve these functions can be best understood in terms of network effects. An increase in the number of buyers and sellers for a given asset increases the flow of buy and sell trades, which decreases the cost of trading (bid-ask spread), all else equal. Reductions in the bid-ask spread lower the trading costs faced by market participants.[209] As trading costs fall, more buyers and sellers are attracted

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[206] Madigan, B., "The Sign of a Stabilizing Market: XRP Utility," *Ripple Insights*, January 30, 2020, https://ripple.com/insights/the-sign-of-a-stabilizing-market-xrp-utility/. *See also*, Madigan, B., "Liquidity and Global Markets: 101" April 20, 2020, *Ripple Insights*, https://ripple.com/insights/liquidity-and-global-markets-101/. *See also*, Deposition Transcript of Lawrence Angelilli, at 73:18-22 (Q: "Is it true that over time Ripple did try – did arrange for an increase in market makers and liquidity in the markets in which the ODL transactions were occurring. A: Yes."); Vias, M., "Ripple Q1 2017 XRP Markets Reports," *Ripple Insights*, April 18, 2017, at 3 and 4 (Ripple commented publicly that "[i]n order for any asset to be successful it needs ample liquidity, something XRP attracted during the quarter. This was a reassuring sign of progress towards the eventual fiat liquidity XRP requires to ultimately be successful for payments, its natural use case.").

[207] Deposition Transcript of Lawrence Angelilli, at 19:7-14 ("Q: And was the liquidity of the markets important to the product working … A: It's essential to the product working.").

[208] Harris, L., Trading and Exchanges: Market Microstructure for Practitioners, Oxford University Press, 2003, at 394 ("Liquidity is the ability to trade large size quickly, at low cost, when you want to trade."). Harris (2003) also identifies immediacy, width, and depth as the key dimension of liquidity, at 398.

[209] The bid-ask spread reflects the typical gap between the amount that buyers are willing to pay for a contract at a given moment (the "bid") and the higher price sellers demand to sell a contract at that moment (the "ask"). The

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to that market, further increasing market liquidity and resulting in a virtuous feedback whereby "liquidity demand begets liquidity supply."[210] The market becomes more attractive to participants wishing to engage in trade by reducing bid-ask spreads, increasing market depth (how much a trade affects the market price) and offering greater immediacy because it is easier to find offsetting bids and offers. Since liquidity reduces trading costs, market participants will be attracted to markets with greater liquidity, other things being equal, which further benefits market participants.

127.   In practice, the mechanisms for achieving a liquid market are integrally linked to the market structure.[211] Two types of market structures are relevant here: the first is the over-the-counter market where bilateral transactions are privately negotiated between the two counterparties involved in the final transaction; the second is the central limit order market where trading happens between participants on a centralized exchange/market. In the latter case, the buy and sell orders of participants are matched anonymously following the price-time priority electronic matching protocol of a particular exchange.

ii.   *Ripple Customized Their Efforts to Accommodate Different Trading Mechanisms for XRP*

128.   Consistent with its strategic objective to provide global financial settlement solutions, Ripple engaged in various efforts to improve the market liquidity of XRP on the XRP

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bid-ask spread is a cost to price-taking customers (such as customers seeking to hedge). These customers buy at the prevailing (higher) "ask" price and later close a contract by selling at the (lower) "bid" price. In contrast, the bid-ask spread is a source of profits to liquidity providers such as market makers.

[210] Foucault, T., O. Kadan, and E. Kandel, "Liquidity Cycles and Make/Take Fees in Electronic Markets," *The Journal of Finance*, Vol. 68 (1), February 2013, at 303.

[211] Demsetz, H., "The Cost of Transacting," *Quarterly Journal of Economics*, Vol. 82 (1), 1968; Black, F., "Toward a Fully Automated Stock Exchange," *Financial Analysts Journal*, November-December 1971; Merton, R., "A Simple Model of Capital Market Equilibrium with Incomplete Information," *The Journal of Finance*, Vol. 42(3), July 1987.

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Ledger, the on-ledger decentralized exchange, the DEX,[212] and the off-ledger, cryptocurrency exchanges. Ripple customized their liquidity enhancing efforts to the salient features and trading mechanisms of these different market structures and the needs of Ripple's ODL product.

129.   Peer-to-peer trading between wallets on a blockchain, such as the XRP Ledger, resembles an OTC market. Duffie et al. (2005) explain that search cost in locating counterparties and the bargaining power of participants are critical components of market liquidity in OTC markets.[213] The absence of a centralized market implies that a participant who wants to buy (or sell) must search for a seller (or buyer), incurring opportunity or other cost until she finds one. Once a counterparty is located, the price is bilaterally negotiated. The execution price therefore reflects the participants' outside option to find another counterparty. Because of the difficulty in locating a counterparty, there is a need for intermediaries who could facilitate more immediate execution between counterparties.[214] Intermediaries are specialists who fulfill the role of liquidity provision. As such, intermediaries hold inventories of the assets they trade to fulfill anticipated and non-anticipated purchase and sale requests.[215] The inventory holding necessarily exposes the intermediary to the risk of price changes or loss of value in their inventories.[216]

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[212] "Decentralized Exchange," https://xrpl.org/decentralized-exchange.html.

[213] Duffie, D., N. Gârleanu, and L. Pederson, "Over-the-Counter Markets," *Econometrica*, Vol. 73(6), 1815-1847, November 2005.

[214] Duffie, D., N. Gârleanu, and L. Pederson, "Over-the-Counter Markets," *Econometrica*, Vol. 73(6), 1815-1847, November 2005.

[215] The academic literature discusses the risks of inventory imbalances to intermediaries. *See, e.g.*, Schrimpf, A., and V. Sushko, "FX Trade Execution in Complex and Highly Fragmented," *BIS Quarterly Review*, December 2019, at 44; Moore, M, A. Schrimpf, and V. Sushko, "Downsized FX markets: causes and implications," *BIS Quarterly Review*, December 2016, at 36; Lyons, R., "A simultaneous trade model of the foreign exchange hot potato," *Journal of International Economics*, Vol. 42, 277-290, 1997.

[216] Bjønnes, G., and D. Rime, "Dealer Behavior and Trading Systems in Foreign Exchange Markets," *Journal of Financial Economics*, Vol. 75, 571-605, 2005. Amihud, Y., and H. Mendelson, "Dealership Market: Market-Making with Inventory," *Journal of Financial Economics*, Vol. 8, 31-53, 1980.

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130.   Ripple entered into contracts with wholesale purchasers ████████████

████████████████, and ████ between August 2017 and July 2020.[217] These wholesale

purchasers typically acted as intermediaries for XRP trading through their OTC trading desks.[218]

The XRP purchased by intermediaries such as ████████████████████████████, and ████

are used to facilitate the OTC trading with their customers.[219]

131.   Trading on the DEX, the XRP Ledger exchange, and the off-ledger

cryptocurrency exchanges occurs on the central limit order book of the particular exchange.

Central limit order books ("CLOB") are well-suited to markets with demand and supply from

numerous participants that want to trade the same product frequently and in relatively small

size.[220] Execution prices are determined using sophisticated procedures based on the time and

price priority matching of orders.[221] The details of the CLOB trading rules are determined by the

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[217] ██
██
████████████████████████████████; and "OTC Crypto Trading," https://www ████ .io/trading/otc-
trading/.

[218] *See, e.g.*, Hobbs, J., <u>Digital Assets: Your Guide to Investing and Trading in the New Crypto Market</u>, at Thames
Lane Limited, 2021. *See also*, ██
████████████████████████ *See also*, Chaparro, F., "Crypto's Largest Over-the-Counter Trading Desks
are Reporting Record Volumes," *The Block*, November 30, 2020,
https://www.theblockcrypto.com/post/86020/crypto-otc-trading-bitcoin-record-volume.

[219] Grossman, S., and M. Miller, "Liquidity and Market Structure," *The Journal of Finance*, Vol. 43(3), July 1988.

[220] Burdett, K., and M. O'Hara, "Building Blocks an Introduction to Block Trading," *Journal of Banking and
Finance*, Vol. 11, 1987, at 195 (who argue, when referring to continuous-auctions like order books, "[t]his
continuous auction process works well in that it generally provides continuous and stable prices when there are
a large number of small trades. In the case of large volume transactions, or block trades, however, this auction
process falters. The problem lies in the possibility that such large trades may be information-related.");
Benveniste, L., A. Marcus, and W. Wilhelm, "What's Special About the Specialist?" *Journal of Financial
Economics*, Vol. 32 (1), August 1992 (who build a theoretical model where long-standing and repeated
relationships are used by traders to discriminate between informed and uninformed traders, leading to lower
transaction costs for uninformed trades). *See also*, Desgranges, G., and T. Foucault, "Reputation-Based Pricing
and Price Improvements," *Journal of Economics and Business*, Vol. 57 (6), November-December 2005.

[221] Biais, B., L. Glosten, and C. Spatt, "Market Microstructure: A Survey of Micro-Foundations, Empirical Results
and Policy Implications," *Journal of Financial Markets*, Vol. 8, 217-264, 2005.

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particular cryptocurrency exchange. For example, Ripple distributed XRP to market makers with the explicitly stated purpose of using XRP to promote liquidity of XRP by quoting binding bid and offer prices.[222] As I discussed in Section II, Ripple entered into contracts with market makers to promote liquidity on the XRP Ledger exchange, such as the 2014 contract with ▮▮▮▮▮▮▮▮, and on the off-ledger cryptocurrency exchanges, such as the 2017 contract with ▮▮▮▮▮▮.[223]

132.   A CLOB can fail without a sufficient volume of two-way flow between buy and sell orders. The intuition for market failure is that, if the limit order book is too thin, price elastic market order submitters will scale back their market order submissions. However, as the endogenous distribution of submitted market order quantities shifts towards zero, the probability of limit order execution falls, which, given ex ante limit order submission costs, leads to fewer limit orders and, thus, a thinner book. If market order submissions are sufficiently elastic, the limit order book may fail.[224] Ripple's distributions to market makers facilitated the two-way order flow at exchanges. Ripple also distributed XRP to programmatic sellers who brokered bid-

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[222] *See, e.g.*, Ripple delivers a specified number of units of XRP to the market maker that they then use to "promote liquidity of fiat and crypto currencies within the Ripple Network" and "to quote binding bid and offer prices for 'virtual units of value' within the Ripple Network." ▮▮▮▮▮▮ and Ripple, *Market Making Agreement*, February 7, 2014 (RPLI_SEC 0507336, at 336 and 337). The Ripple Network means the "decentralized, open source, global payment network operating on the Ripple protocol." *See also*, ▮▮▮ and Ripple Markets, ▮▮ *Market Making Agreement*, March 31, 2014 (RPLI_SEC 0947000, at 003), ▮▮▮▮ *XRP Market Making Agreement*, May 17, 2017 (RPLI_SEC 0581494) ("▮▮▮▮ agrees to engage in efforts to promote the liquidity of XRP on the ▮▮▮▮▮▮▮▮ by implementing an incentive and rebate program… The Parties are entering into this Agreement in an effort to increase the liquidity of XRP… through the application of certain XRP transaction volume."); ▮▮▮▮▮▮▮ *Exchange Order*, August 20, 2019 (RPLI_SEC 0899089, at 089).

[223] ▮▮▮▮▮ and Ripple, *Market Making Agreement*, February 7, 2014 (RPLI_SEC 0507336) and ▮▮▮▮▮▮, *Market Maker and Programmatic Market Activity Agreement*, February 14, 2017 (RPLI_SEC 0899145).

[224] Portniaguina, E., D. Bernhardt, and E. Hughson, "Hybrid Markets, Tick Size and Investor Trading Costs," *Journal of Financial Markets*, Vol. 9, 433-447, 2006.

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ask trades to supplement the market liquidity for XRP. As I discussed earlier, Ripple entered into

a contract with ▊▊ whereby ▊▊ transacted XRP according to a programmatic schedule.[225]

133.   As explained in more detail below, Ripple also worked with some cryptocurrency

exchanges in an effort to increase XRP liquidity.

iii.   Listing XRP on Crypto Exchanges[226]

134.   Ripple entered into contracts with six cryptocurrency exchanges, including with

▊▊▊▊, effective January 11, 2017, ▊▊▊, effective May 17, 2017, ▊▊▊, effective May

18, 2017, ▊▊▊▊▊, effective May 29, 2017, ▊▊▊, effective June 2, 2017, and ▊▊▊,

effective October 13, 2017.[227] In an effort to facilitate market liquidity at these cryptocurrency

exchanges, Ripple funded volume incentive and trading fee rebate programs at the

cryptocurrency exchanges for the duration of the respective programs.[228]

135.   In return for receiving the distributions from Ripple, a cryptocurrency exchange

would "agree to engage in efforts to promote the liquidity of XRP on its exchange platform."[229]

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[225] ▊▊ and Ripple, *Programmatic Market Activity Agreement*, June 2, 2017 (RPLI_SEC 0507300, at 300-301). The contract with ▊▊ was amended in March 2018. *See,* ▊▊ and Ripple Markets, *Amendment to the Programmatic Market Activity Agreement with* ▊▊, March 1, 2018 (RPLI_SEC 0537727).

[226] The Complaint refers to cryptocurrency exchanges as "digital asset trading platforms." Complaint, at ¶¶ 154-169.

[227] Ripple entered into a contract with the exchange ▊▊, effective October 30, 2017 but ▊▊ never listed XRP. Ripple's Rebates and Incentive Agreements with Digital Currency Exchanges (RPLI_SEC 0303838).

[228] *See, e.g.*, ▊▊▊▊▊▊▊ and Ripple Markets, *XRP Fee Rebate Program Agreement*, October 13, 2017 (RPLI_SEC 0153866, at 867) ("Ripple, in its sole discretion, may make such payment in *U.S. Dollar or XRP*.") (emphasis added); ▊▊▊▊ and Ripple Markets, *BITBANK XRP Volume Incentive Program*, May 18, 2017 (RPLI_SEC 0507292); ▊▊▊▊▊▊▊▊ and Ripple Markets, ▊▊▊ *Fee Rebate Program*, May 29, 2017 (RPLI_SEC 0154338, at 338); ▊▊▊ and Ripple Markets, ▊▊▊ *XRP Volume Incentive Program*, June 2, 2017 (RPLI_SEC 0066688, at 689), ▊▊▊▊▊ and Ripple Markets, *XRP Listing, Volume Incentive and Rebate Agreement*, May 17, 2017 (RPLI_SEC 0511334, at 335), ▊▊▊ and Ripple Markets, *XRP/EUR Volume Incentive Program*, *XRP/EUR Fee Rebate Program*, January 11, 2017 (RPLI_SEC 0507279, at 280).

[229] *See, e.g.*, ▊▊▊▊▊▊▊ and Ripple Markets, *XRP Fee Rebate Program Agreement*, October 13, 2017 (RPLI_SEC 0153866, at 866); ▊▊▊▊▊ and Ripple Markets, ▊▊▊ *XRP Volume Incentive*

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The promotion of liquidity of XRP by exchanges took two forms. First, pursuant to these contracts, exchanges would pay a volume incentive rebate to certain eligible participants, identified by each exchange based on trading volumes.[230] Second, exchanges would pay trading fee rebates to eligible participants that were calculated as a percentage of the exchanges' trading fees. For example, the percentage of the trading fee rebates decreased from 100% to 25% over the duration of the program with ███████.[231] The durations of the respective programs varied by exchange and typically terminated between three and 12 months from the effective date with the option of early termination "upon mutual agreement" or extension.[232]

136.   Ripple's volume incentive distribution and rebates to exchanges are part of Ripple's cost of developing a liquid market for XRP. Other trading platforms also adjust fee structures to attract liquidity. For example, trading platforms pay a per-share rebate to their members to encourage them to provide ("make") liquidity in the form of resting orders. In the event that an execution occurs, the liquidity provider receives a rebate and the "taker" that

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Program, May 18, 2017 (RPLI_SEC 0507292, at 292); ████████████████████████████████ and Ripple Markets, ███████████ *Fee Rebate Program*, May 29, 2017 (RPLI_SEC 0154338, at 338); ████████████ and Ripple Markets, ████████ *XRP Volume Incentive Program*, June 2, 2017 (RPLI_SEC 0066688, at 688); ████████████████ and Ripple Markets, *XRP Listing, Volume Incentive and Rebate Agreement*, May 17, 2017 (RPLI_SEC 0511334, at 334); ███████ and Ripple Markets, *XRP/EUR Volume Incentive Program*, *XRP/EUR Fee Rebate Program*, January 11, 2017 (RPLI_SEC 0507279, at 279).

[230] *See, e.g.*, ███████ and Ripple Markets, *XRP/EUR Volume Incentive Program*, *XRP/EUR Fee Rebate Program*, January 11, 2017 (RPLI_SEC 0507279, at 280).

[231] ████████ and Ripple Markets, *XRP/EUR Volume Incentive Program*, *XRP/EUR Fee Rebate Program*, January 11, 2017 (RPLI_SEC 0507279, at 286).

[232] *See, e.g.*, ████████████████████ and Ripple Markets, *XRP Fee Rebate Program Agreement*, October 13, 2017 (RPLI_SEC 0153866, at 871); ████████████ and Ripple Markets, ████████ *XRP Volume Incentive Program*, May 18, 2017 (RPLI_SEC 0507292, at 293); ████████████ *Fee Rebate Program*, May 29, 2017 (RPLI_SEC 0154338, at 340); ████████ and Ripple Markets, ████████ *XRP Volume Incentive Program*, June 2, 2017 (RPLI_SEC 0066688, at 689-690), ████████████████ and Ripple Markets, *XRP Listing, Volume Incentive and Rebate Agreement*, May 17, 2017 (RPLI_SEC 0511334, at 337); ███████ and Ripple Markets, *XRP/EUR Volume Incentive Program*, *XRP/EUR Fee Rebate Program*, January 11, 2017 (RPLI_SEC 0507279, at 282); ████ and Ripple, *XRP Volume Incentive and Fee Rebate Program Agreement*, October 30, 2017 (RPLI_SEC 0847167, at 174).

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executes against the resting order pays a fee.[233] This type of "maker-taker" fee model has also

been adopted by other platforms.[234]

137.   Ripple contracted with only six cryptocurrency exchanges, which represents less

than 4% of the more than 150 exchanges that listed XRP as of December 2020. Exhibit 13 shows

the effective and termination dates for Ripple's contracts with each of the respective

exchanges.[235] These dates show that the majority of Ripple's rebate programs were relatively

short term, with the majority of these programs terminating after less than 10 months. The

number of exchanges that list XRP continued to grow even after Ripple stopped their

distributions to cryptocurrency exchanges around April 2018. As Exhibit 14 shows, the number

of exchanges that list XRP increased from 38 in April 2018 to more than 150 by December 2020.

Trading and market liquidity at the vast majority of these exchanges has developed organically.

iv.   *Similar to Ripple's Efforts, It Is Common Practice for Trading Platforms to Use Efforts to Enhance Market Liquidity*

138.   It takes time to develop a liquid market on a particular platform or for a particular

asset. Bitcoin started trading around mid-2010, but was thinly traded during the early period and

the market liquidity of Bitcoin improved over time as the market matured.[236] Many

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[233] "Maker-Taker Fees on Equities Exchanges," *SEC Market Structure Advisory Committee*, October 20, 2015, https://www.sec.gov/spotlight/emsac/memo-maker-taker-fees-on-equities-exchanges.pdf.

[234] "In 1997, the Island ECN was among the first markets to adopt maker-taker fees, which it employed to attract order flow through liquidity rebates." *See*, "Maker-Taker Fees on Equities Exchanges," *SEC Market Structure Advisory Committee*, October 20, 2015, https://www.sec.gov/spotlight/emsac/memo-maker-taker-fees-on-equities-exchanges.pdf. Cardella, L., J. Hao, and I. Kalcheva, "Liquidity-Based Trading Fees and Exchange Volume," August 1, 2017, at 6, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2149302. *See also*, Hendershott, et al. (2011) finding that allowing new participants in the equity markets, such as algorithmic traders, improves liquidity. Hendershott, T., C. Jones, and A. Menkveld, "Does Algorithmic Trading Improve Liquidity?" *The Journal of Finance*, Vol. 66(1), February 2011.

[235] Ripple's Rebate & Incentive Agreements with Digital Currency Exchanges (RPLI_SEC 0303838).

[236] *See, e.g.*, Scharnowski, S., "Understanding Bitcoin Liquidity," *Finance Research Letters*, Vol. 38, 2021, at 3, and Badev, A., and M. Chen, "Bitcoin: Technical Background and Data Analysis," *Finance and Economics*

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cryptocurrency exchanges have fee structures designed to incentivize liquidity. For example, Bitstamp's exchange has a tiered fee structure based on a participant's trading volume whereby the exchange discounts the trading fees for participants with higher average volume. Participants with lower average trading volume will pay higher exchange-based fees than other participants with higher average trading volume.[237] Cryptocurrency exchanges also make it cheaper to add liquidity than to take it from the market. For example, exchanges Coinbase and Gemini have no fees for market maker volume.[238] Maker-taker fee structures are also used by other electronic markets in an effort to increase liquidity on their platforms.[239]

139.   Other trading platforms also engage in efforts to improve market liquidity for a particular product or a particular platform. For example, the electronic inter-dealer broker ("IDB") market for on-the-run U.S. Treasury securities changed the minimum bid-ask spread (known as the "tick size") on the two-year note in November 2018, which improved market liquidity and price discovery for these notes.[240] Other trading platforms, such as the Chicago Mercantile Exchange ("CME") or Swaps Execution Facilities ("SEFs"), also adopted fee

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Discussion Series Divisions of Research & Statistics and Monetary Affairs, Federal Reserve Board, Washington, D.C., October 2014, at 22 ("Although trading of the virtual currency began around mid-2010, much of this trading was fairly sparse up until 2013."). *See also*, Figure 20 for low weekly trading volumes at cryptocurrency exchanges during the early period.

[237] "Unified Fee Schedule," https://www.bitstamp.net/fee-schedule/.

[238] Coinbase fee schedule: "What are the fees on Coinbase Pro?," https://support.pro.coinbase.com/customer/en/portal/articles/2945310-fees; Gemini fee schedule: "API Fee Schedule," https://gemini.com/api-fee-schedule/#overview.

[239] Foucault, T., O. Kadan, and E. Kandel, "Liquidity Cycles and Make/Take Fees in Electronic Markets," *The Journal of Finance*, February 2013, at 305.

[240] Fleming, M., G. Nguyen, and F. Ruela, "Minimum Price Increment, Competition for Liquidity Provision, and Price Discovery," *Federal Reserve Bank of New York*, Staff Report No. 886, February 2021, at 28 ("Overall, we conclude that a smaller tick size in the Treasury market improves market quality, encourages more competition in liquidity provision and pricing from dealers relative to HFTs, and enhances high-frequency price discovery.").

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structures and trading rules to improve market efficiency and attract participants to their platforms.[241] The CME has adjusted the minimum bid-ask spread to ensure efficient trading on their platform.[242] A minimum tick size that is too high will make spreads too high and create costs that deter liquidity, but a minimum tick size that is too low will discourage participation by liquidity providers. Similarly, margin requirements set by exchange-directed clearinghouses must be sufficiently high to credibly convince market participants of the integrity of the clearinghouse, but low enough to encourage trading activity.

F.   ECONOMIC ASSERTIONS FOR COMMONALITY ARE FUNDAMENTALLY FLAWED

140.   The SEC argues that the "fortunes" of XRP purchasers depend on Ripple successfully executing their "XRP Strategy."[243] According to the SEC, the success or failure of Ripple's XRP Strategy was contingent on Ripple "propelling trading of XRP [that] drives demand for XRP, which will dictate investors' profits (recognized in increased prices at which they could sell XRP) or losses."[244] The SEC also argues that the "fortunes" of XRP purchasers

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[241] Harris (2003) explains that "trading rules [in order-driven markets] are very important. They affect how traders behave, and they determine who has power and privilege in the market. Since these rules affect how traders form their order submission strategies, they greatly influence whether traders decide to supply or take liquidity." *See* Harris, L., Trading & Exchanges: Market Microstructure for Practitioners, Oxford University Press, 2003, at 137.

[242] The CME reduced the tick size for some FX products, "[i]n 2014, 2015 and 2016 CME Group successfully reduced the Minimum Price Increment (MPI) in our JPY/USD, MXN/USD, EUR/USD, and CAD/USD contracts to provide more granular pricing and actionable liquidity – to reduce execution costs." *See* Chicago Mercantile Exchange, "FX Products: Minimum Price Increments: Tighter Spreads, Same Trusted Markets," https://www.cmegroup.com/trading/fx/mpi.html#.

[243] Complaint, at ¶ 291 ("Because XRP is fungible, the fortunes of XRP purchasers were and are tied to one another, and each depend on the success of Ripple's XRP Strategy.").

[244] Complaint, at ¶ 317 ("Throughout the Offering … Defendants repeatedly told investors that Ripple's XRP-related efforts were meant to spur "demand" for XRP. Ripple at times even explicitly tied the hope for an increase in demand to what any reasonable investor would understand an increase in demand to entail: an increase in XRP's market price.").

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were aligned with each other and with Ripple because Ripple "pooled the funds it raised in the Offering."[245] As I explain below, the SEC's claims are flawed as a matter of economic substance.

141.   There was no pooling of the funds. Specifically, Chris Larsen, Jed McCaleb, and Arthur Britto collectively held the remaining 20 billion XRP units and gave 80 billion XRP units to Ripple. Furthermore, Chris Larsen, Jed McCaleb, and Arthur Britto did not pool their XRP holdings and were free to behave independently from each other and independently from Ripple.

142.   In Section II, I discuss the categories of contracts identified by the Complaint and show that these contracts do not have any contractual rights entitling these counterparties to a share of Ripple's profits if Ripple is successful in its ongoing efforts to manage and develop its business operations. There are no such contractual rights and no ongoing obligations for Ripple to expend efforts to increase XRP's price. My empirical analyses in Section III further show that the variation in long-run price return of XRP can be explained by exogenous cryptocurrency price returns or put differently, by factors outside Ripple's control; and further that Ripple's XRP distributions do not have a statistically significant relation with long-run XRP price return after controlling for returns of other cryptocurrencies outside of Ripple's control.

143.   Distributions of XRP increase the circulating supply, but the demand for XRP is not controlled by Ripple. As such, XRP purchasers are free to behave independently from each other and independently from Ripple. Ripple's sales of XRP represent a fraction of the overall purchases of XRP. In fact, a majority of XRP are not purchased directly from Ripple but are traded anonymously at the cryptocurrency exchanges. Since at least the second quarter of 2017, Ripple's monthly XRP distributions have been under 1% of the overall XRP trading volume reported by CryptoCompare.

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[245] Complaint, at ¶ 291 and ¶ 293.

144.   Some parties that received XRP directly from Ripple sell rather than hold XRP. For example, market makers use their XRP to quote bids and offers, and improve market liquidity, and ODL customers purchase XRP at exchanges to effectuate cross-border transfers. Indirect purchasers of XRP also hold XRP for only short time periods. I demonstrate this empirically by calculating the ratio of XRP trading volume to the circulating supply.[246] This ratio, referred to as "velocity," typically measures the frequency with which one unit of a particular currency is used for purchases.[247] A higher velocity means that the asset is traded ("turned-over") or "used" more often. As I show in Exhibit 15, the velocity of XRP using the average 28-day XRP trading volume across all cryptocurrency exchanges reported by CryptoCompare increases over time and volume exceeds the XRP circulating supply, particularly after 2017.

145.   In contrast, Ripple holds XRP over a long-term horizon. Because of the differences in both the timing and the duration of holding periods between Ripple and direct and indirect purchasers of XRP, their exposure to XRP price volatility and therefore to risk is different. [248] Exhibit 16 shows the monthly XRP price volatility, measured as the standard

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[246] I use the trading volume across all cryptocurrency exchanges tracked and reported by CryptoCompare and separately also, the trading volume across only the Top Tier cryptocurrency exchanges reported by CryptoCompare. I explain the data I used in my analyses in more detail in Appendix C.

[247] Fisher, I., The Purchasing Power of Money: Its Determination and Relation to Credit, Interest and Crises, New York: Macmillan, 1911, at 17 ("Velocity of circulation, or rapidity of turnover, is simply the quotient obtained by dividing the total money payments for good in the course of a year by the average amount of circulation by which those payments are effected."). *See also*, Hakkio, C., "Exchange Rate Volatility and Federal Reserve Policy," *Federal Reserve Bank of Kansas City*, 1984. Velocity has been used to analyze cryptocurrencies. *See, e.g.*, Lyons, R., and G. Viswanath-Natraj, "What Keeps Stablecoins Stable?" *Working paper*, May 2020.

[248] Academic research by Leirvik (2021) shows that time-variation in the volatility of market liquidity exposes investors to risks that varies over time. *See* Leirvik, T. "Cryptocurrency Returns and the Volatility of Liquidity," *Finance Research Letters* (forthcoming), 2021.

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deviation of the daily closing price of XRP over the 28-day period, varied between a low of less than 1.5% and a high of over 35%.

IV.   XRP IS A VIRTUAL CURRENCY

A.   CRYPTOCURRENCIES, INCLUDING XRP, ARE VIRTUAL CURRENCIES

146.   Economists often define money based on what can be done with it. Economists often argue that money (or currency) serves three complementary roles – it can be used as a store of value, a medium of exchange, and a unit of account.[249] Fiat currency is issued, usually, by a nation's government. For example, in the United States, the U.S. Treasury, through the U.S. Mint and the Bureau of Engraving and Printing, produces the coins and bills we spend. Fiat money has no intrinsic value – that is, its value is not backed by gold or some other commodity.[250] Instead, its value comes from its general acceptance as money. In other words, U.S. dollars are useful as money because of the way people use them in the economy. Currency, such as the U.S. dollar, is designated as legal tender, circulates, and is customarily used and accepted as a medium of exchange in the country of issuance. The CFTC defines a virtual currency as a "digital representation of value that functions as a medium of exchange, a unit of account, and/or a store of value."[251] But, for example, virtual currencies do not have legal tender status in any U.S.

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[249] *See, e.g.*, Mankiw, N., Macroeconomics, 8th edition, 2018, at 82-83.

[250] Money has no intrinsic value. In contrast, gold can be made into jewelry or the commodity corn can be used to make bread. *See, e.g.*, Ball, L., Money Banking and Financial Markets, 2nd edition, Worth Publishers, 2012, at 31.

[251] Lab CFTC, A CFTC Primer of Virtual Currencies, October 17, 2017, at 4, https://www.cftc.gov/sites/default/files/idc/groups/public/%40customerprotection/documents/file/labcftc_primercurrencies100417.pdf.

jurisdiction.[252] The CFTC regulates virtual currencies such as Bitcoin as commodities per

Section 1a(9) of the Commodity Exchange Act.[253]

147.   Cryptocurrencies, including XRP, are not fiat currencies, but as I explain below,

XRP has the same *function* as money albeit as a virtual currency. My assessment of XRP is

consistent with the Department of Justice ("DOJ") and Financial Crimes Enforcement Network

(FinCEN) determination that XRP is a virtual currency.[254] In 2020, FinCEN restated its finding

that XRP is a virtual currency.[255]

148.   The first feature of money that economists often discuss is store of value. Money

is a convenient way to store wealth. For example, a textbook by Prof. Mankiw explains:

> "As a store of value, money is a way to transfer purchasing power from the
> present to the future. If I work today and earn $100, I can hold the money and
> spend it tomorrow, next week, or next month."[256]

In a 2017 speech, then-Chairman of the SEC Jay Clayton explained that cryptocurrencies also

serve as a store of value:

> "Cryptocurrencies: Speaking broadly, cryptocurrencies purport to be items of
> inherent value (similar, for instance, to cash or gold) that are designed to enable
> purchases, sales, and other financial transactions. They are intended to provide
> many of the same functions as long-established currencies such as the U.S. dollar,
> euro or Japanese yen but do not have the backing of a government or other body.

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[252] "Virtual Currencies," *IRS*, https://www.irs.gov/businesses/small-businesses-self-employed/virtual-currencies.

[253] *See* In the Matter of: Coinflip, Inc., d/b/a Derivabit, and Francisco Riordan, CFTC Docket No. 15-29, September 17, 2015, http://www.cftc.gov/idc/groups/public/@lrenforcementactions/documents/legalpleading/enfcoinfliprorder09172 015.pdf.

[254] Department of the Treasury Financial Crimes Enforcement Network Guidance, FIN-2013-G001, March 18, 2013. *See also*, Office of Foreign Assets Control Frequently Asked Questions, No. 559, March 19, 2018, https://home.treasury.gov/policy-issues/financial-sanctions/faqs/559.

[255] United States Department of Justice, Cryptocurrency Enforcement Framework, Report of the Attorney General's Cyber Digital Task Force, October 8, 2020, at 25 (describing XRP as a "virtual currency"), https://www.justice.gov/ag/page/file/1326061/download.

[256] Mankiw, N., Macroeconomics, 8th edition, 2018, at 82.

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Although the design and maintenance of cryptocurrencies differ, proponents of cryptocurrencies highlight various potential benefits and features of them, including (1) the ability to make transfers without an intermediary and without geographic limitation, (2) finality of settlement, (3) lower transaction costs compared to other forms of payment and (4) the ability to publicly verify transactions. Other often-touted features of cryptocurrencies include personal anonymity and the absence of government regulation or oversight. Critics of cryptocurrencies note that these features may facilitate illicit trading and financial transactions, and that some of the purported beneficial features may not prove to be available in practice."[257]

149.   The second useful feature of money is a unit of account – *i.e.*, a convenient way to measure and communicate amounts such as prices. For example, Prof. Mankiw notes that:

"As a unit of account money provides the terms in which prices are quoted and debts are recorded. Microeconomics teaches us that resources are allocated according to relative prices – the prices of goods relative to other goods – yet stores post their prices in dollars and cents. A car dealer tells you that a car costs $20,000, not 400 shirts (even though it may amount to the same thing). Similarly, most debts require the debtor to deliver a specified number of dollars in the future, not a specified amount of some commodity. Money is the yardstick with which we measure economic transactions."[258]

150.   XRP can be used as a common base to express the price of a unit of XRP on the XRP Ledger but also to express prices at cryptocurrency exchanges. XRP can also be used to pay for services. For example, *Hotsailer* accepts XRP as payments.[259] Another example is the travel site Travala, which quotes the price of a hotel room in XRP and accepts XRP as payment.[260]

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[257] Chairman Jay Clayton, "Statement on Cryptocurrencies and Initial Coin Offerings," *U.S. Securities and Exchange Commission*, Public Statement, December 11, 2017, https://www.sec.gov/news/public-statement/statement-clayton-2017-12-11.

[258] Mankiw, N., Macroeconomics, 8th edition, 2018, at 82. *See also*, Ball, L., Money Banking and Financial Markets, 2nd edition, at 28-29.

[259] "How to pay with cryptocurrencies?," https://hostsailor.com/how-to-pay-with-cryptocurrencies/.

[260] "What is XRP (XRP)?," https://www.travala.com/payment/xrp.

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151.   The third feature of money that economists often note is that money serves as a

"medium of exchange." In other words, it can be used to get goods and services (in exchange for

money). For example, Prof. Mankiw explains that:

> "As a medium of exchange, money is what we use to buy goods and services.…When
> we walk into stores, we are confident that the shopkeepers will accept our money in
> exchange for the items they are selling. The ease with which an asset can be
> converted into the medium of exchange and used to buy other things – goods and
> services – is sometimes called the asset's liquidity. Because money is the medium of
> exchange, it is the economy's most liquid asset."[261]

Similarly, the Bank of International Settlements Annual Economic Report, 2018:

> "Money has three fundamental and complementary roles. It is … a medium of
> exchange: a seller accepts it as a means of payment, in the expectation that
> somebody else will do the same."[262]

152.   XRP can be used as a medium of exchange in peer-to-peer exchange, for

example, between wallets on the blockchain, and can also be exchanged for fiat currency (USD,

Euro, Japanese Yen, etc.) or other cryptocurrencies at the cryptocurrency exchanges.

B.   RIPPLE'S ON-DEMAND-LIQUIDITY PLATFORM USES XRP AS A MEDIUM OF EXCHANGE

153.   Ripple's ODL product uses XRP as a medium of exchange in the transfer of

international payments. The growth in ODL volume, as I discuss in more detail below, reinforces

XRP's role as virtual currency. The ODL product was unique in terms of on-demand liquidity

provisions, as MoneyGram's CFO Angelilli testified that ODL delivered on its promise of near

instantaneous money transfers and 24/7 trading.[263]

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[261] Mankiw, N., <u>Macroeconomics</u>, 8th edition, 2018, at 82.

[262] Bank for International Settlements, *Annual Economic Report*, 2018, at 82.

[263] Deposition Transcript of Lawrence Angelilli, at 46:12-47:10, and at 63. ("A. …What Ripple did was provide the
ability to cash trades after noon, and then what it did was extended the window for cash trades in those markets
because we didn't have a new deadline. Q. And so Ripple's ability to do those trades 24/7 was a major plus of
the ODL product. A. That was what was particularly interesting to us in the beginning was that it was 24/7, and
for a while, we were doing trades on Saturdays and Sundays and holidays when the banks were closed … the

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154.   In June 2019, MoneyGram, the second largest U.S. remittance company after Western Union, entered into a partnership with Ripple to use ODL in its cross-border payments.[264] Using the actual MoneyGram payments data, I demonstrate that the failure rate of payments and cost efficiencies of ODL improved over time as the market for XRP became more liquid.

   i.   *MoneyGram Transferred a Significant Amount of XRP Across Many Corridors Using ODL*

155.   Between July 2019 and December 2020, MoneyGram transferred approximately $2.3 billion using ODL. My analysis of the actual MoneyGram transfers shows that MoneyGram made more than 200,000 separate transfers, with an average size of approximately $12,000.[265]

156.   I summarize MoneyGram's transfers over time by remittance corridor in Exhibit 17. Initially, Ripple focused on the more active USD-MXN corridor. By November 2020, MoneyGram expanded its use of ODL to five corridors, including, USD-MNX, EUR-USD, AUD-USD, USD-PHP, and AUD-PHP. MoneyGram's use of ODL increased over time, reaching a high of $410 million transferred in April 2020. MoneyGram ODL transactions were

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blockchain was extremely effective in getting those trades through when -- on seven days a week. I -- Q. I think that answers the question. A. Okay. Q. So the ODL product did work in terms of the speed that it promises; is that fair? A. Correct. Q. And it did work in terms of the 24/7 ability to do trades? A. Yes.").

[264] The partnership with MoneyGram was terminated in December 2020 after the filing of the initial SEC Complaint. During his deposition, MoneyGram CFO explained the reason for the termination. *See* Deposition Transcript of Lawrence Angelilli, at 182:10-20 ("Q. And why did you terminate the agreement with Ripple? A. We were unable to trade XRP on any U.S. exchange. And in our conversations with Ripple to find an alternative, they were ultimately unsuccessful. And so -- so it became clear that we really couldn't use the product anymore. Q. And why were you unable to trade XRP on any U.S. exchange? A. U.S. exchanges stopped trading the token after the SEC filed suit.").

[265] Detailed ODL transaction data received from MoneyGram. SEC-LIT-EPROD-000077198, SEC-LIT-EPROD-000075518, SEC-LIT-EPROD-000073620, SEC-LIT-EPROD-000075553, SEC-LIT-EPROD-000075486, SEC-LIT-EPROD-000075476, SEC-LIT-EPROD-000071477, MONEYGRAM_SEC_0017277.

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substantial, not just in absolute terms but also relative to MoneyGram's overall payments transfer

activity, which constitutes approximately $65 billion annually.[266]

157.   My analysis shows that MoneyGram, a brand name customer for ODL, made

extensive use of ODL, as demonstrated by the number of transfers, the aggregate size of

transfers, and the development of five different remittance corridors across the globe.

ii.   *The On-Demand-Liquidity Product Is Technically Feasible and Efficiency Improved Over Time*

158.   ODL technical efficiency improved over MoneyGram's tenure. For example,

during MoneyGram's tenure, the percentage of failed transactions decreased: approximately 11%

of transfers failed during the first month of operation of the USD-MXN corridor, and no transfers

failed during December 2020. Across all corridors, approximately 10% of transactions failed in

May 2019, but the number and percentage of failed transactions decreased. By December 2019,

the failure rate was on average below 1% across all corridors. I show the number of failed,

completed, and total transfers across all corridors used by MoneyGram in Exhibit 18.

iii.   *The Cost of Using ODL Decreased Over Time as the XRP Market Liquidity Improved*

159.   As with traditional remittances, MoneyGram incurred a cost when using ODL in

their cross-border remittances. The ODL costs are comprised of three components: two

exchange-related fees, charged respectively by the sending and the receiving exchanges, and a

foreign currency (FX) spread. Following the MoneyGram convention as reported in their

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[266] Deposition Transcript of Lawrence Angelilli, at 30:4-7.

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transactions, I show the MoneyGram FX disadvantage for each corridor in Exhibit 19.[267] The

MoneyGram data shows that, on average, the cost disadvantage of ODL decreased over time.

The data also shows that the cost disadvantage is relatively lower for the more liquid, active

corridors such as EUR-USD and USD-MNX than for the less liquid AUD-PHP corridor.

160.   I show the change in the components of the ODL cost during MoneyGram's

usage in Exhibit 20. The exchange fees for all the relevant corridor exchanges either decreased or

remained constant during MoneyGram's ODL transfers.[268] The data importantly also shows that,

on average, the FX spread decreased between 2 bps and 4 bps over time as the liquidity of the

XRP market improved. ODL's effectiveness depends critically on having two-way flow for XRP

at cryptocurrency exchanges (*i.e.*, market liquidity). It therefore took time to develop sufficient

liquidity at the relevant cryptocurrency exchanges: "liquidity around the digital asset XRP is the

lifeblood of Ripple's On-Demand Liquidity [...]. As a bridging tool in ODL, the greater the

liquidity of XRP, the less cost and risk in each transaction."[269]

161.   Ripple explained that there needs to be a two way flow of purchases and sales for

XRP before ODL becomes efficient. Therefore, ODL can achieve economies of scale only if the

market reaches a sufficient level of market liquidity. I develop a stylized example to show the

break-even levels of liquidity and transfer size at which the costs of using ODL would be on par

with using traditional means of cross-border remittances. Exhibit 21 compares the cost

disadvantage of using ODL versus traditional means for different remittance sizes. The cost of

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[267] The FX disadvantage indicates the average percentage cost increase in sending money via ODL when compared to the Reuters FX Benchmark. A positive FX disadvantage means that ODL is more costly than a hypothetical transfer at the Reuters benchmark rate.

[268] The corridors receiving PHP have no receiving exchange fee (Coinsphere) and use the same sending exchange (Bitstamp) as the other corridors.

[269] Madigan, B., "Liquidity and Global Markets 101," *Ripple Insights*, April 20, 2020.

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using ODL is on par with traditional means for a remittance of approximately $2,200. Exhibit 22

shows the same sizes but with lower costs of using ODL to be more commensurate with smaller

FX spreads in more liquid XRP markets. For transactions below approximately $7,500, the cost

of using ODL is on par with that of MoneyGram's traditional FX system.[270]

iv. Ripple's Rebates and Incentives to MoneyGram Is Not Unique and Generally Used to Encourage the Adoption of New Technology/Products

162.   Ripple's partnership with MoneyGram gave them brand awareness for ODL.[271]

Ripple paid transaction volume incentives and rebates to MoneyGram as part of the cost for

launching a new product, as I explain in more detail below. Ripple agreed to make three types of

payments tied to MoneyGram's use of ODL: rebate fees, transaction fees, and performance

bonuses.[272] Rebate fees were designed to bring MoneyGram's cost of using ODL to 5 basis

points relative to a transfer at a hypothetical benchmark rate. For example, if the cost of a

particular ODL transaction that involved converting USD $100 to MXN with a benchmark FX

rate of 20 MXN/USD was 1% or 100 basis points,[273] then Ripple would rebate to MoneyGram

an amount needed to bring the cost down to 5 basis points.[274] Transaction fees were a reward for

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[270] Note that MoneyGram's business model involves using the traditional FX system to preposition sufficient amounts to fulfill one or several days of anticipated customer transactions, and it chose to use the ODL product in the same vein – as opposed to using it "on demand" as its customers initiated transactions. ("We preposition cash in various countries and currencies to facilitate settlement of transactions.") MoneyGram 2019 10-K, at 37.

[271] MoneyGram's CFO Angelilli testified that simply having MoneyGram as a partner was a "positive" for Ripple and a "global news story." He agreed that obtaining a "big headline customer" would have influenced whether Ripple would have offered MoneyGram incentives to use ODL. He believed that "lead[ing] with a low price or even los[ing] money in the initial phase of [a] growth curve" happens "all the time" in Internet commerce. Deposition Transcript of Lawrence Angelilli, 2021, at 83:12-24, 85:3-13.

[272] Preclearance letter, September 26, 2019 (SEC-LIT-EPROD-000071389, at 393). *See also*, MoneyGram and Ripple, *Work Order #1*, June 17, 2019 (RPLI_SEC0239684).

[273] Implying that ODL returned 1,980 MXN (=99.00% x 100 x 20) rather than 2,000 MXN.

[274] As if ODL returned 1,999 MXN (=99.95% x 100 x 20). The rebate would be 19 MXN or USD $0.95.

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MoneyGram for using ODL, running from a high of 2.5% of MoneyGram's ODL volume to a low of 0.75%, depending on the overall volume achieved.[275] Additionally, Ripple would pay MoneyGram a performance bonus if MoneyGram hit an ODL volume target. MoneyGram was an early adopter, and incentives encouraged MoneyGram to send significant volume with ODL, which in turn helped make the product more efficient.

163.   The use of rebates and incentives to attract customers and gain market share is a common business practice. For example, payment processors like Visa, Mastercard, and Alibaba provide rebates to customers to promote their payment products.

> Each year Visa pays billions in "[c]lient incentives [that] consist of incentives provided in contracts with financial institution clients, merchants and strategic partners for various programs designed to grow payments volume, increase Visa product acceptance, win merchant routing transactions over our network and drive innovation. These incentives are primarily accounted for as reductions to revenues."[276]

Visa paid $5.5 billion in client incentives in fiscal year 2018, and more than $6 billion in fiscal years 2019 and 2020.[277] Mastercard similarly pays incentives for marketing purposes of approximately $8 billion per year in 2019 and 2020:

> "In order to increase transaction volumes, enter new markets and expand our Mastercard-branded cards and enabled products and services, we seek to enter into business agreements with customers through which we offer incentives, pricing discounts and other support that promote our products. In order to stay competitive, we may have to increase the amount of these incentives and pricing discounts."[278]

Alibaba, as part of its "merchant incentive program," provides preferential commission rates for merchants within their program if they hit certain metrics:

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[275] Preclearance letter, September 26, 2019 (SEC-LIT-EPROD-000071389, at 394 and 408). *See also*, MoneyGram and Ripple, *Work Order #1*, June 17, 2019 (RPLI_SEC0239684).

[276] Visa 2020 Annual Report, at 45, 47.

[277] Visa 2020 Annual Report, at 47.

[278] Mastercard 2020 Annual Report, at 25, 48.

> "Commission revenue did not grow in proportion to the growth of Tmall online physical goods GMV (excluding unpaid orders) primarily because of the revenue mix shift within Tmall Supermarket from commission-based revenue towards direct sales, which is classified as 'Others' revenue under China commerce retail business, and also because more merchants under our merchant incentive program achieved annual GMV targets and received preferential commission rates."[279]

164.   Another example of such incentives can be found in trading platforms. Trading platforms may subsidize market makers to foster liquidity,[280] offer volume discounts to attract the most active traders, subside investment in costly technology,[281] and structure trading fee models to reward liquidity providers.[282]

165.   In addition, conditional rebates – that is, rebates that apply if certain conditions are met, such as quantity purchased, type of payment used, or customer loyalty – can have significant pro-competitive effects, one of which is achieving economies of scale:

> "In industries with high fixed costs, such as for instance innovative industries (information technology, pharmaceutical research, etc.) rebates allow suppliers to increase output and, in turn, recover their fixed costs more rapidly (since they will be

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[279] Alibaba Group Fiscal 2020 Annual Report, at 136.

[280] Foucault, T., O. Kadan, and E. Kandel, "Liquidity Cycles and Make/Take Fees in Electronic Markets," *The Journal of Finance*, 2013, 299-341, at 305 ("In this setting, as shown below, it is optimal for the trading platform to charge a lower fee on the side that has the lowest aggregate monitoring intensity. In this way, the platform maximizes the trading rate by optimally balancing the rates at which liquidity is consumed and supplied. For instance, subsidizing market makers is optimal when they are outnumbered by market takers or when their monitoring cost is large. Indeed, they will monitor the market more closely to capture the rebate and as a result new liquidity is supplied faster after each trade.").

[281] Hendershott, T., and R. Riordan "Algorithmic Trading and the Market for Liquidity," *Journal of Financial and Quantitative Analysis*, 2013, 1001-1024, at 1002, 1006 ("Most markets offer volume discounts to attract the most active traders. During our sample period the German competition authority did not allow for generic volume discounts, but rather required that discounts have a cost-sensitive component. The DB [Deutsche Bourse] successfully asserted that algorithm-generated trading is lower cost and highly sensitive to fee reductions and, therefore, could receive quantity discounts… The fee rebate program also subsidized the investment in costly technology, encouraging more investors to automate and boosting trading volume and liquidity at the DB.").

[282] "Trading Fee Models and Their Impact on Trading Behavior," *International Organization of Securities Commissions*, 2013, 1-29, at 5, 6.

able to achieve economies of scale by spreading their fixed costs over larger volumes) resulting in lower average total costs and prices for consumers…"[283]

166.   Cryptocurrencies in general and ODL in particular are examples of innovative technology and products, where speeding up adoption could drive significant consumer benefits in the future.

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[283] Geradin, D., "A Proposed Test for Separating Pro-competitive Conditional Rebates from Anti-competitive Ones," *World Competition*, Vol. 32(1), 2009, 41-70, at 64-65.

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I declare under penalty of perjury that the foregoing is true and correct. Executed on October ___4___, 2021
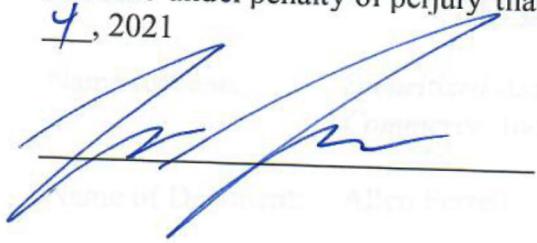
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Exhibit 1
Summary of Ripple's Funding From Private Investors

Year	Funding Type	Shares	Proceeds	Notes
2012	Common Stock	800,000	$200,000	
2014	Series A	7,359,045	$6,770,422	Related to the Convertible Notes Payable
2014	Series A	4,033,742	$7,091,134	Series A Preferred stock
2015	Series A	13,866,966	$24,443,190	Series A Preferred stock
2016	Series B	14,482,502	$55,014,394	One of the investors of the Series B is SBI Holdings, which Ripple entered a joint venture agreement with.
2019	Series C	3,252,790	$194,823,000	Series C Redeemable Convertible Preferred stock
2014	███	███	███	████████████████████████
2015	███	███	███	███████████████

Sources: Ripple Labs, Inc., *Consolidated Financial Statements,* 2013-2019.

Notes: On July 1, 2017, Ripple effected a two-for-one stock split to stockholders. Share and per share information for periods after July 1, 2017 have been adjusted to reflect the impact of the stock split.

In April 2018, Ripple repurchased and constructively retired 70,000 shares of Class A common stock from an investor at a price of $20 per share for a total purchase price of $1,400,000. Shares reported prior to this date do not account for this repurchase.

During fiscal years ended Dec 31, 2018 and 2019, Ripple repurchased and constructively retired 1,563,372 and 2,380,000 shares of Series A stock. In addition, during the year ended Dec 31, 2019, Ripple repurchased and constructively retired 1,436,628 shares of Series B. Shares reported prior to these dates do not account for these repurchases.

As of December 20, 2019, Ripple was authorized to issue 180,000,000 shares of Class A common stock and 35,331,121 shares of Class B common stock. The shares info in this note reflects the two-for-one stock split.

On February 18, 2020, pursuant to its Series C financing, Ripple paid $163.9 million to redeeem 1.3 million shares of Series A and 1.4 million of Series B. Original reported shares for Series A and B do not account for this redemption.

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Exhibit 2
Most of the Variance in Non-XRP Price Returns Can Be Explained with Four PCs

| | Estimation Period 1 8/6/2013 - 12/15/2020 | | Estimation Period 2 8/11/2015 - 12/20/2020 | |
	Proportion of Variance Explained	Cumulative	Proportion of Variance Explained	Cumulative
Principal Component 1	80.7%	80.7%	91.1%	91.1%
Principal Component 2	6.8%	87.5%	5.5%	96.6%
Principal Component 3	3.8%	91.3%	1.3%	97.9%
Principal Component 4	2.8%	94.1%	0.6%	98.4%

Sources: CryptoCompare; CoinMarketCap.

Note: Reports only the first four principal components.

Exhibit 3

Regression of XRP Price Return on Principal Components of Other Cryptocurrencies

	Estimation Period 1 8/6/2013 - 12/15/2020	Estimation Period 2 8/11/2015 - 12/20/2020
Constant	0.058	-0.022
	(0.042)	(0.041)
Principal Component 1	0.217*	-0.001*
	(0.018)	(0.000)
Principal Component 2	-0.002	-0.003*
	(0.055)	(0.001)
Principal Component 3	0.135	0.129*
	(0.146)	(0.004)
Principal Component 4	0.577*	0.052*
	(0.280)	(0.008)
Principal Component 5		0.058*
		(0.012)
Principal Component 6		0.384*
		(0.031)
Principal Component 7		-0.149*
		(0.017)
Principal Component 8		-0.229*
		(0.028)
Principal Component 9		-0.041
		(0.036)
Principal Component 10		0.022
		(0.033)
Principal Component 11		-0.231*
		(0.045)
Observations	96	70
Adjusted R-squared	0.541	0.923
Non-XRP Coins used in PCA	9	91

Sources: CryptoCompare; CoinMarketCap.

Notes:

[1] Standard errors, in parentheses, are robust to heteroskedasticity (Huber/White).

[2] * indicates statistical significance at the 5% level.

[3] All return variables are 28-day returns.

[4] The number of Principal Components are selected by the BIC criteria.

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Exhibit 4
Twenty Largest Cryptocurrencies Used in Estimation Period 2's PCA
August 11, 2015

Rank	Name	Symbol	Market Cap	Price
1	Bitcoin*	BTC	$3,917,142,819	$269.03000
2	Litecoin*	LTC	$173,045,227	$4.08300
3	Ethereum	ETH	$64,569,288	$1.05900
4	Dash	DASH	$17,913,487	$3.17500
5	Dogecoin	DOGE	$16,454,876	$0.00016
6	Bytecoin	BCN	$13,568,003	$0.00007
7	Stellar	XLM	$11,598,046	$0.00224
8	BitShares	BTS	$11,597,738	$0.00464
9	Peercoin*	PPC	$10,520,136	$0.46430
10	Nxt	NXT	$10,280,170	$0.01024
11	Namecoin*	NMC	$6,794,901	$0.55802
12	Monero	XMR	$5,359,598	$0.60320
13	Counterparty	XCP	$4,049,815	$1.50900
14	Clams	CLAM	$2,851,185	$3.44900
15	MonaCoin	MONA	$2,561,511	$0.11680
16	Startcoin	START	$2,424,392	$0.07856
17	BlackCoin	BLK	$2,040,558	$0.02685
18	NovaCoin*	NVC	$1,397,991	$1.24000
19	MintCoin	MINT	$1,358,500	$0.00006
20	Rimbit	RBT	$1,260,632	$0.01113

Sources: CryptoCompare; CoinMarketCap.

Notes:

[1] The table reports the largest 20 cryptocurrencies used in Estimation Period 2's PCA, by market cap, as of August 11, 2015.

[2] * Denotes a cryptocurrency also used in Estimation Period 1 (Aug. 2013 - Dec. 2020) PCA regressions.

[3] Estimation Period 1 PCA uses 9 cryptocurrencies, not all of which are reported above, as their market cap on August 11, 2015 was outside of the top-20 cryptocurrencies.

[4] XRP market cap on August 11, 2015 was $274 million (less than Bitcoin and more than Litecoin).

Exhibit 5
Regression of XRP Returns on Returns of Largest Market-Cap Coins

	Estimation Period 1 8/6/2013 – 12/15/2020		Estimation Period 2 8/11/2015 – 12/20/2020
Constant	0.076	Constant	-0.016
	(0.051)		(0.039)
BTC Return	-0.393	BTC Return	-0.661*
	(0.373)		(0.263)
LTC Return	0.760*	LTC Return	0.775*
	(0.370)		(0.207)
NMC Return	-0.056	ETH Return	0.082
	(0.107)		(0.110)
PPC Return	0.172	DASH Return	0.080
	(0.201)		(0.118)
FTC Return	0.053	DOGE Return	0.209
	(0.063)		(0.142)
		BCN Return	0.478*
			(0.156)
		XLM Return	0.636*
			(0.028)
		BTS Return	-0.277*
			(0.077)
		PPC Return	-0.553*
			(0.268)
		NXT Return	-0.008
			(0.049)
Observations	96		70
Adjusted R-squared	0.540		0.941

Sources: CryptoCompare; CoinMarketCap.
Notes:
[1] Standard errors, in parentheses, are robust to heteroskedasticity (Huber/White).
[2] * indicates statistical significance at the 5% level.
[3] All return variables are 28-day returns.
[4] Five (Estimation Period 1) or ten (Estimation Period 2) largest coins by market cap as of the start date of the respective estimation period
(8/6/2013 for Estimation Period 1 and 8/11/2015 for Estimation Period 2).

Exhibit 6
Regression of XRP Returns on Principal Components of Other Cryptocurrencies and Returns of Other Assets
Estimation Period 1 - 8/6/2013 - 12/15/2020

	Cryptocurrency Factors	Cryptocurrency and S&P 500	Cryptocurrency and Equity Indices	Cryptocurrency and Commodity Index	Cryptocurrency and Gold	Cryptocurrency and Fiat Currencies
Constant	0.058	0.063	0.062	0.052	0.055	0.061
	(0.042)	(0.044)	(0.044)	(0.039)	(0.043)	(0.043)
Principal Component 1	0.217*	0.218*	0.220*	0.216*	0.219*	0.216*
	(0.018)	(0.019)	(0.020)	(0.018)	(0.019)	(0.019)
Principal Component 2	-0.002	-0.001	-0.005	0.008	-0.008	-0.004
	(0.055)	(0.057)	(0.056)	(0.054)	(0.049)	(0.053)
Principal Component 3	0.135	0.137	0.139	0.126	0.146	0.145
	(0.146)	(0.149)	(0.144)	(0.147)	(0.151)	(0.143)
Principal Component 4	0.577*	0.581*	0.588*	0.584*	0.572*	0.568*
	(0.280)	(0.286)	(0.287)	(0.285)	(0.275)	(0.281)
S&P 500 Return		-0.629				
		(1.025)				
MCSI World Index Return			-2.025			
			(2.438)			
MCSI Emerging Market Index Return			1.922			
			(2.135)			
Bloomberg Commodity Index Return				-1.158		
				(1.810)		
Gold Return					0.760	
					(1.506)	
U.S. Dollar Index (USDX) Return						-3.691
						(15.875)
Japanese Yen Return						-1.532
						(3.515)
Euro Return						0.355
						(14.525)
Observations	96	96	96	96	96	96
Adjusted R-squared	0.541	0.536	0.535	0.538	0.537	0.531

Sources: CryptoCompare; CoinMarketCap; Bloomberg.

Notes:
[1] Standard errors, in parentheses, are robust to heteroskedasticity (Huber/White).
[2] * indicates statistical significance at the 5% level.
[3] All return variables are 28-day returns.
[4] The number of Principal Components are selected by the BIC criteria.

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Exhibit 7
Regression of XRP Returns on Principal Components of Other Cryptocurrencies and Returns of Other Assets
Estimation Period 2 - 8/11/2015 - 12/20/2020

	Cryptocurrency Factors	Cryptocurrency and S&P 500	Cryptocurrency and Equity Indices	Cryptocurrency and Commodity Index	Cryptocurrency and Gold	Cryptocurrency and Fiat Currencies
Constant	-0.022	-0.024	-0.022	-0.018	-0.023	-0.032
	(0.041)	(0.041)	(0.041)	(0.039)	(0.043)	(0.043)
Principal Component 1	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*	-0.001*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Principal Component 2	-0.003*	-0.003*	-0.003*	-0.003*	-0.004*	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Principal Component 3	0.129*	0.128*	0.128*	0.128*	0.128*	0.127*
	(0.004)	(0.005)	(0.005)	(0.004)	(0.005)	(0.004)
Principal Component 4	0.052*	0.052*	0.051*	0.051*	0.051*	0.053*
	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.007)
Principal Component 5	0.058*	0.057*	0.054*	0.058*	0.057*	0.056*
	(0.012)	(0.013)	(0.014)	(0.012)	(0.012)	(0.010)
Principal Component 6	0.384*	0.383*	0.381*	0.383*	0.385*	0.376*
	(0.031)	(0.033)	(0.033)	(0.031)	(0.031)	(0.031)
Principal Component 7	-0.149*	-0.148*	-0.146*	-0.148*	-0.151*	-0.144*
	(0.017)	(0.017)	(0.017)	(0.018)	(0.017)	(0.018)
Principal Component 8	-0.229*	-0.232*	-0.235*	-0.232*	-0.232*	-0.241*
	(0.028)	(0.032)	(0.033)	(0.028)	(0.030)	(0.028)
Principal Component 9	-0.041	-0.042	-0.043	-0.043	-0.043	-0.045
	(0.036)	(0.037)	(0.038)	(0.038)	(0.039)	(0.037)
Principal Component 10	0.022	0.022	0.023	0.021	0.023	0.016
	(0.033)	(0.033)	(0.034)	(0.032)	(0.033)	(0.027)
Principal Component 11	-0.231*	-0.235*	-0.238*	-0.241*	-0.235*	-0.238*
	(0.045)	(0.049)	(0.050)	(0.045)	(0.047)	(0.042)
S&P 500 Return		0.398				
		(0.820)				
MCSI World Index Return			0.028			
			(1.201)			
MCSI Emerging Market Index Return			0.624			
			(1.132)			
Bloomberg Commodity Index Return				0.945		
				(1.119)		
Gold Return					0.623	
					(1.205)	
U.S. Dollar Index (USDX) Return						-14.888
						(9.626)
Japanese Yen Return						-3.193
						(2.149)
Euro Return						-7.289
						(7.561)
Observations	70	70	70	70	70	70
Adjusted R-squared	0.923	0.921	0.920	0.922	0.922	0.925

Sources: CryptoCompare; CoinMarketCap; Bloomberg.
Notes:
[1] Standard errors, in parentheses, are robust to heteroskedasticity (Huber/White).
[2] * indicates statistical significance at the 5% level.
[3] All return variables are 28-day returns.
[4] The number of Principal Components are selected by the BIC criteria.

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Exhibit 8
Monthly Net Outflows From Ripple (XRP)
Aug. 1, 2013 - Dec. 20, 2020
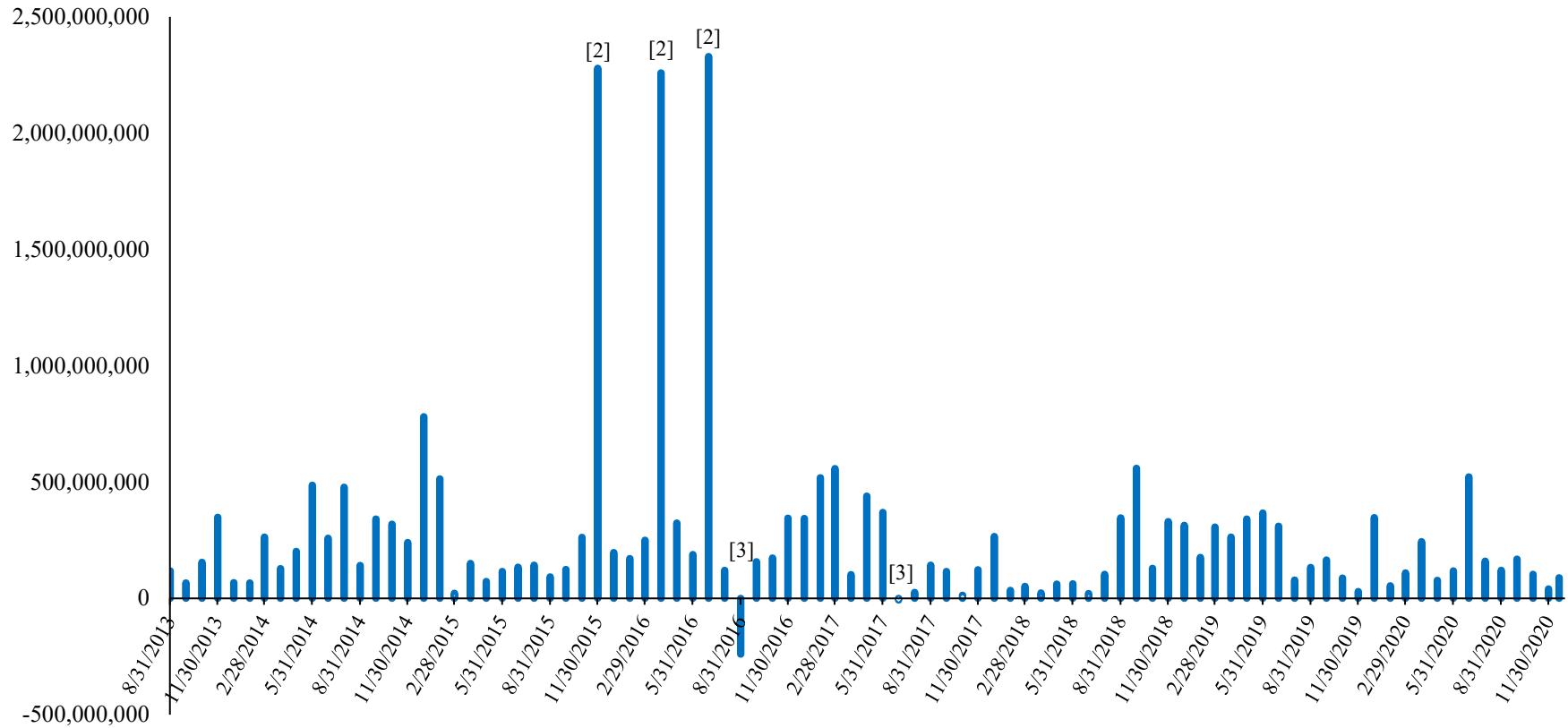
Sources: RPLI_SEC 0304724-RPLI_SEC 0304726; RPLI_SEC 1100594-RPLI_SEC 1100596.

Notes:
[1] For December 2020, reports distributions thru Dec. 20, 2020.
[2] Large flows of XRP include: (1) 1.08B XRP to ▮▮▮▮ Custody account in November 2015; (2) 3.5B XRP into the initial Reserved account in March 2016; (3) 2B XRP into Jed [McCaleb's] Custody account in June 2016. There are additional large flows in 2015-2016.
[3] Total monthly net outflows are negative (i.e., inflows into Ripple) in August 2016 (240M XRP) and June 2017 (7M XRP).

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Exhibit 9
Monthly Net Outflows From Ripple (in U.S. Dollars)
Aug. 4, 2013 - Dec. 20, 2020
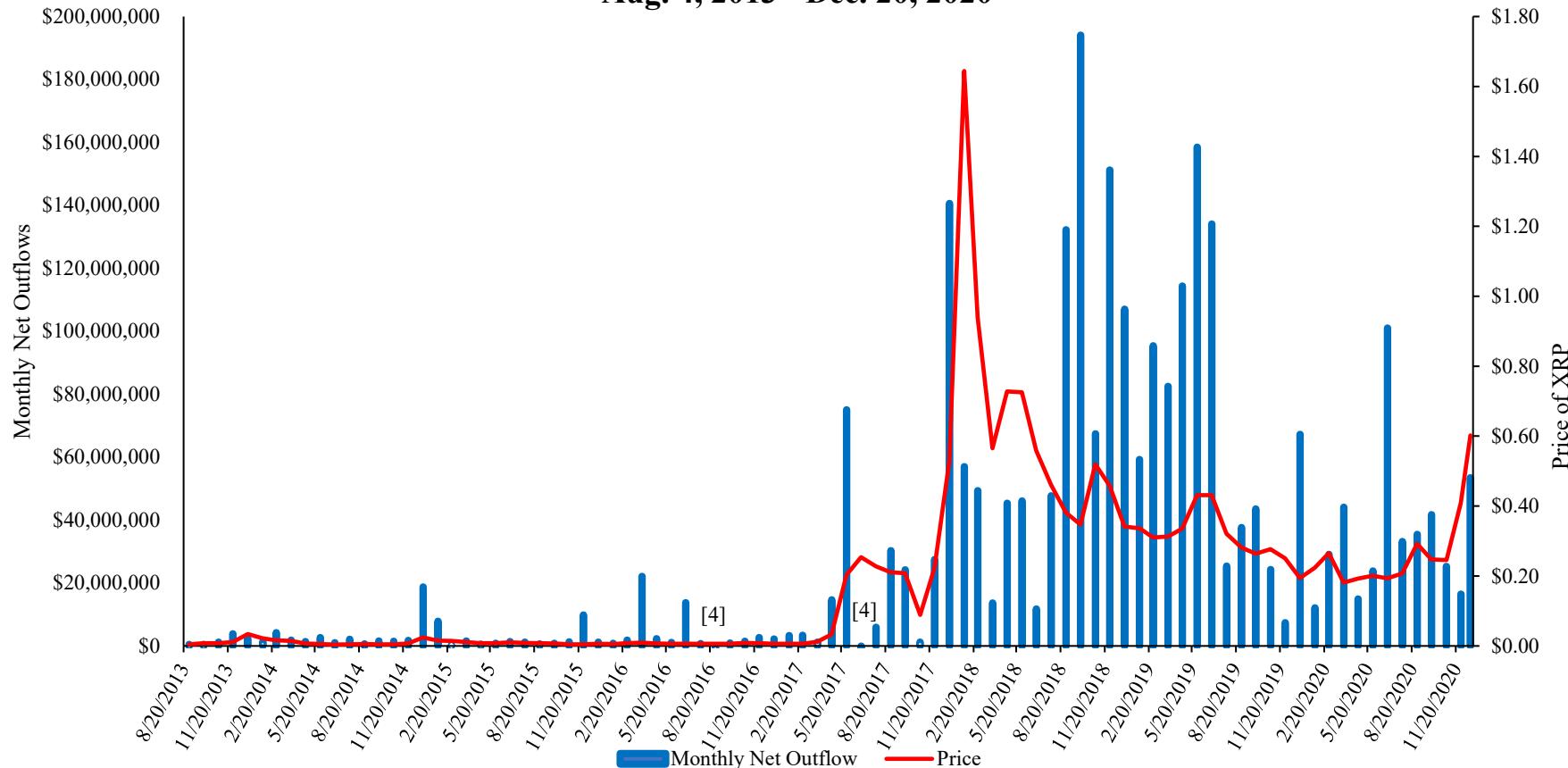
Sources: RPLI_SEC 0304724-RPLI_SEC 0304726; RPLI_SEC 1100594-RPLI_SEC 1100596; CoinMarketCap; CryptoCompare.

Notes:

[1] Large flows of XRP in 2015-2016 include, for example: (1) 1.08B XRP to ███ custody account in November 2015; (2) 3.5B XRP into the initial Reserved account in March 2016; (3) 2B XRP into Jed [McCaleb's] Custody account in June 2016. There are additional large flows.

[2] Dollar amounts calculated using the daily midpoint USD price of XRP on the date of distribution for inflows and outflows. Midpoint is equal to 1/2(open price + closing price). Uses CryptoCompare prices for Jan. 21, 2015-Dec. 20, 2020; CoinMarketCap prices prior to Jan. 21, 2015.

[3] For December 2020, reports distributions thru Dec. 20, 2020.

[4] Total monthly net outflows are negative (i.e., inflows into Ripple) in August 2016 (1.5M USD) and June 2017 (1.7M USD).

[5] Prices are the monthly weighted XRP price (monthly net outflows in USD divided by monthly XRP net outflows).

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Exhibit 10
XRP Total Distributions and Circulating Supply
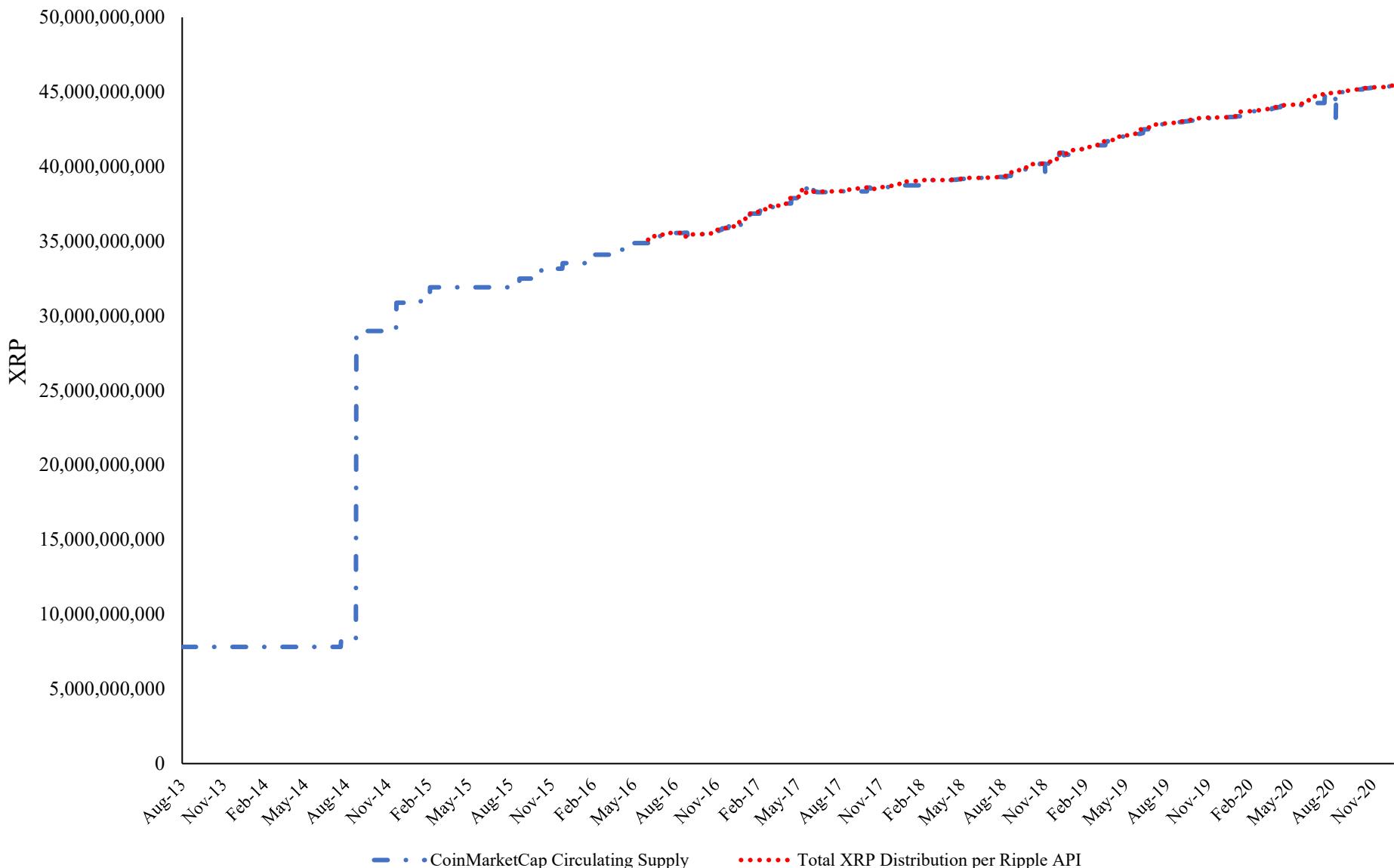
Sources: CoinMarketCap (Circulating Supply) and Ripple's publicly-available API ("Total XRP Distribution").

Notes: Large increase in circulating supply in August 2014 is about 20 billion XRP. Daily Circulating Supply is smoothed by multiplying CoinMarketCap's circulating supply by the daily ratio of opening and closing prices.

Exhibit 11A
Regression of XRP Returns on Ripple XRP Distributions
Estimation Period 1 - 8/6/2013 - 12/15/2020

	Distributions	Lag Distributions	Both Distributions and Lag Distributions
Constant	0.048	0.068	0.057
	(0.066)	(0.058)	(0.067)
Distributions ($ Million)	<0.001		0.001
	(0.001)		(0.002)
Lag Distributions ($ Million)		<0.001	-0.001
		(0.001)	(0.001)
Principal Component 1	0.217*	0.216*	0.216*
	(0.018)	(0.018)	(0.019)
Principal Component 2	-0.001	-0.004	-0.004
	(0.054)	(0.055)	(0.055)
Principal Component 3	0.134	0.125	0.112
	(0.149)	(0.150)	(0.167)
Principal Component 4	0.570	0.579*	0.563
	(0.298)	(0.282)	(0.305)
Observations	96	95	95
Adjusted R-squared	0.536	0.536	0.533

Sources: CryptoCompare; CoinMarketCap; RPLI_SEC 0304724-RPLI_SEC 0304726; RPLI_SEC 1100594-RPLI_SEC 1100596.

Notes:

[1] Standard errors, in parentheses, are robust to heteroskedasticity (Huber/White).

[2] * indicates statistical significance at the 5% level.

[3] All return variables are 28-day returns.

[4] Lagged measures are over the 28-day period preceding the 28-day period over which the dependent variable (XRP return minus risk-free return) is measured.

[5] Distributions are total net outflows from Ripple over the 28-day period.

Exhibit 11B
Regression of XRP Returns on Ripple XRP Distributions
Estimation Period 2 - 8/11/2015 - 12/20/2020

	Distributions	Lag Distributions	Both Distributions and Lag Distributions
Constant	-0.046	-0.086	-0.079
	(0.060)	(0.060)	(0.066)
Distributions ($ Million)	0.001		<0.001
	(0.001)		(0.001)
Lag Distributions ($ Million)		0.002	0.002
		(0.001)	(0.001)
Principal Component 1	-0.001*	-0.001*	-0.001*
	(0.000)	(0.000)	(0.000)
Principal Component 2	-0.003*	-0.003*	-0.003*
	(0.001)	(0.001)	(0.001)
Principal Component 3	0.128*	0.131*	0.131*
	(0.004)	(0.004)	(0.004)
Principal Component 4	0.054*	0.054*	0.053*
	(0.008)	(0.007)	(0.008)
Principal Component 5	0.060*	0.063*	0.063*
	(0.013)	(0.011)	(0.012)
Principal Component 6	0.384*	0.383*	0.383*
	(0.031)	(0.031)	(0.031)
Principal Component 7	-0.147*	-0.154*	-0.155*
	(0.018)	(0.016)	(0.018)
Principal Component 8	-0.228*	-0.228*	-0.229*
	(0.028)	(0.027)	(0.028)
Principal Component 9	-0.039	-0.042	-0.043
	(0.035)	(0.035)	(0.035)
Principal Component 10	0.024	0.034	0.034
	(0.032)	(0.034)	(0.035)
Principal Component 11	-0.230*	-0.234*	-0.235*
	(0.045)	(0.045)	(0.046)
Observations	70	70	70
Adjusted R-squared	0.922	0.925	0.923

Sources: CryptoCompare; CoinMarketCap; RPLI_SEC 0304724-RPLI_SEC 0304726; RPLI_SEC 1100594-RPLI_SEC 1100596.
Notes:
[1] Standard errors, in parentheses, are robust to heteroskedasticity (Huber/White).
[2] * indicates statistical significance at the 5% level.
[3] All return variables are 28-day returns.
[4] Lagged measures are over the 28-day period preceding the 28-day period over which the dependent variable (XRP return minus risk-free return) is measured.
[5] Distributions are total net outflows from Ripple over the 28-day period.
[6] The number of Principal Components are selected by the BIC criteria.

Exhibit 12A
Regression of XRP Returns on Ripple XRP Distributions - Accounting for Volatility
Estimation Period 1 - 8/6/2013 - 12/15/2020

	Not Controlling for Cryptocurrency-Market Factors	Adding PCs of Cryptocurrency Factors
Constant	0.140	0.217
	(0.116)	(0.122)
Lag Distributions ($ Million)	-0.001	-0.001
	(0.001)	(0.001)
Lag XRP Volatility	0.238	-2.822
	(1.020)	(1.457)
Lag XRP Return	-0.368	-0.072
	(0.219)	(0.189)
Lag XRP Return x Lag XRP Volatility	2.870*	1.852*
	(0.630)	(0.691)
Principal Component 1		0.216*
		(0.016)
Principal Component 2		0.008
		(0.057)
Principal Component 3		0.096
		(0.108)
Principal Component 4		0.567
		(0.290)
Observations	95	95
Adjusted R-squared	0.154	0.627

Sources: CryptoCompare; CoinMarketCap; RPLI_SEC 0304724-RPLI_SEC 0304726; RPLI_SEC 1100594-RPLI_SEC 1100596.
Notes:
[1] Standard errors, in parentheses, are robust to heteroskedasticity (Huber/White).
[2] * indicates statistical significance at the 5% level.
[3] All return variables are 28-day returns.
[4] Lagged measures are over the 28-day period preceding the 28-day period over which the dependent variable (XRP return minus risk-free return) is measured.
[5] Lagged distributions are total net outflows from Ripple over the preceding 28-day period.
[6] Volatility calculated as standard deviation of daily returns over 28 days.
[7] The number of Principal Components are selected by the BIC criteria.

Exhibit 12B
Regression of XRP Returns on Ripple XRP Distributions - Accounting for Volatility
Estimation Period 2 - 8/11/2015 - 12/20/2020

	Not Controlling for Cryptocurrency-Market Factors	Adding PCs of Cryptocurrency Factors
Constant	0.297	-0.035
	(0.189)	(0.083)
Lag Distributions ($ Million)	-0.002	0.001
	(0.002)	(0.001)
Lag XRP Volatility	-2.391	-0.960
	(1.863)	(1.575)
Lag XRP Return	-1.277*	-0.593*
	(0.140)	(0.182)
Lag XRP Return x Lag XRP Volatility	9.354*	4.192*
	(0.938)	(1.461)
Principal Component 1		<0.001
		(0.003)
Principal Component 2		-0.001
		(0.002)
Principal Component 3		0.125*
		(0.005)
Principal Component 4		0.049*
		(0.006)
Principal Component 5		0.025
		(0.016)
Principal Component 6		0.218*
		(0.076)
Principal Component 7		-0.093*
		(0.028)
Principal Component 8		-0.150*
		(0.040)
Principal Component 9		-0.011
		(0.033)
Principal Component 10		0.034
		(0.028)
Principal Component 11		-0.132*
		(0.057)
Observations	70	70
Adjusted R-squared	0.644	0.942

Sources: CryptoCompare; CoinMarketCap; RPLI_SEC 0304724-RPLI_SEC 0304726; RPLI_SEC 1100594-RPLI_SEC 1100596.
Notes:
[1] Standard errors, in parentheses, are robust to heteroskedasticity (Huber/White).
[2] * indicates statistical significance at the 5% level.
[3] All return variables are 28-day returns.
[4] Lagged measures are over the 28-day period preceding the 28-day period over which the dependent variable (XRP return minus risk-free return) is measured.
[5] Lagged distributions are total net outflows from Ripple over the preceding 28-day period.
[6] Volatility calculated as standard deviation of daily returns over 28 days.
[7] The number of Principal Components are selected by the BIC criteria.

Exhibit 13
Effective and Termination Dates of Ripple's Contracts with Exchanges

Exchange	Effective Date	Termination Date	Duration (Months)
███████	01/11/17	04/30/17	4
	06/02/17	12/31/17	7
	05/17/17	08/31/17	3
	05/18/17	08/18/17	3
	05/29/17	11/30/17	6
	10/13/17	04/13/18	6
	10/30/17	10/30/18	12

Sources: ███████ and Ripple Markets, *XRP/EUR Fee Rebate Program*, January 11, 2017 (RPLI_SEC 0507279); ██████████████ and Ripple Markets, *XRP Fee Rebate Program Agreement*, October 13, 2017; █████ and Ripple Markets, █████████ *XRP Volume Incentive Program*, June 2, 2017; ██████████████ and Ripple Markets, ██████████ *FeeRebate Program*, May 29, 2017; █████████████████ and Ripple Markets, *XRP Listing, Volume Incentive and Rebate Agreement*, May 17, 2017; ██████████████ and Ripple Markets, ████████ *XRP Volume Incentive Program,* May 18, 2017; ████████, and Ripple Markets, *XRP Volume Incentive and Fee Rebate Program Agreement*, October 30, 2017.

Note: *Ripple Markets entered into a contract with ████ exchange, effective October 30, 2017, but ████ never listed XRP.

Exhibit 14
Number of Exchanges Where XRP Trades According to CryptoCompare
August 4, 2013 - December 20, 2020
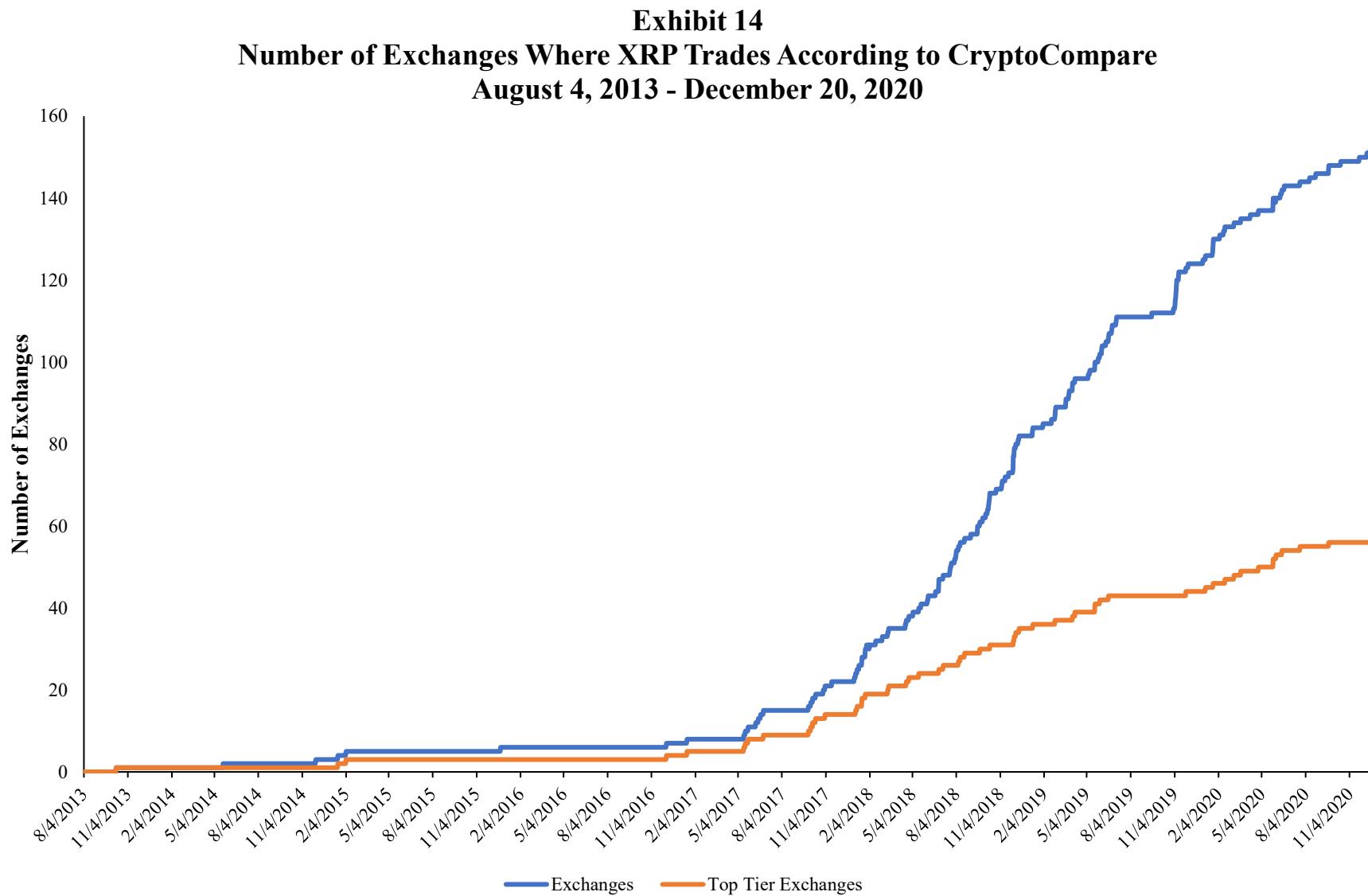
Source: CryptoCompare.

Notes: Number of exchanges according to CryptoCompare based on the earlier of date first listed and first non-zero XRP trading volume and the later of the date last listed and the last date with non-zero XRP trading volume. Only exchanges with positive volume on some date included. CryptoCompare determines whether an exchange is classified as "Top Tier" - exchanges with grades of "B" thru "AA." See, e.g., https://data.cryptocompare.com/reports/exchange-benchmark-july-2020.

Exhibit 15
XRP Velocity
January 21, 2015 - December 20, 2020

Velocity ——— Velocity (Top Tier)
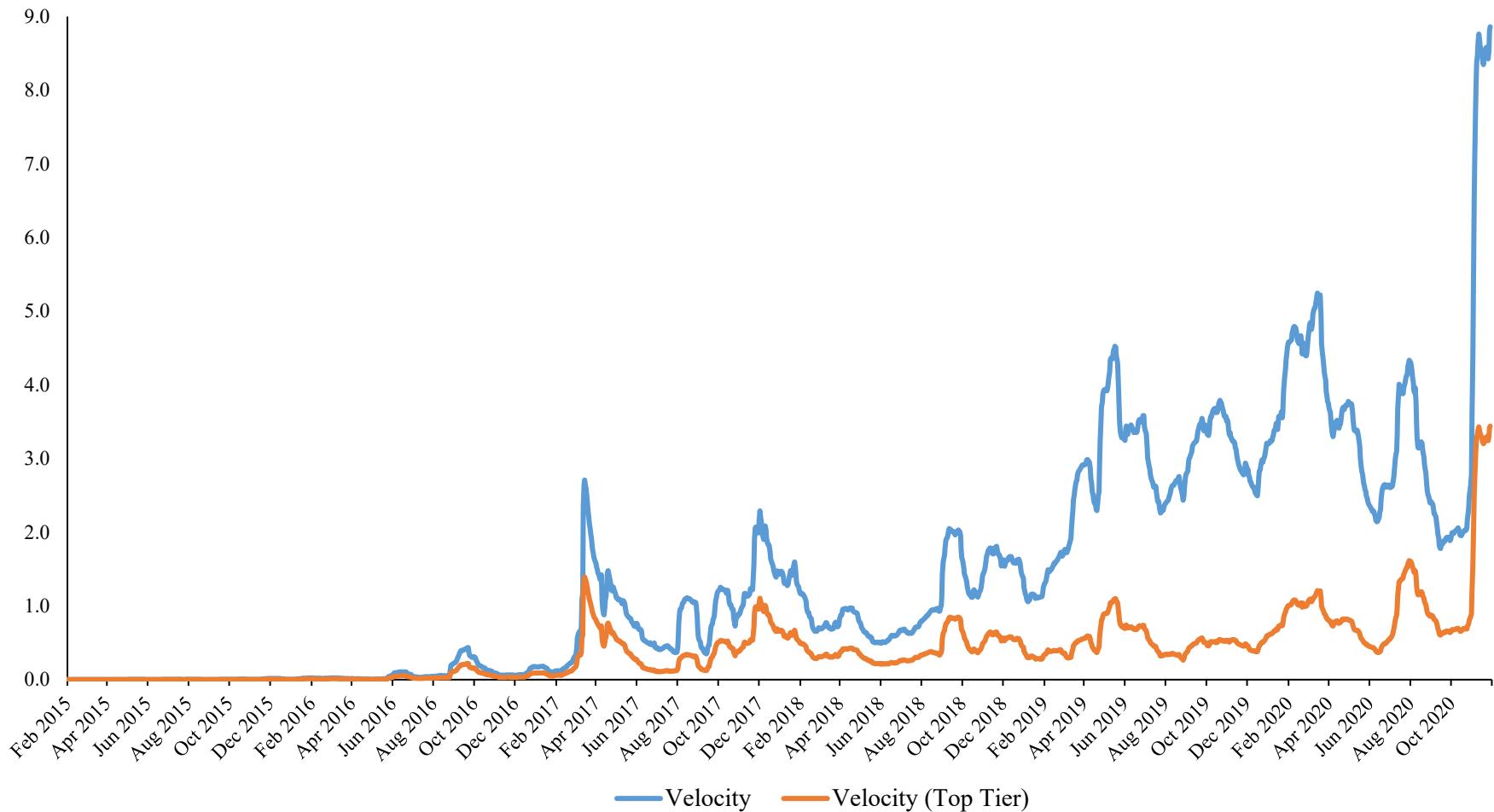
Sources: CoinMarketCap (circulating supply); CryptoCompare (trading volume).

Notes: Velocity is defined as the prior 28 day trading volume divided by the average circulating supply over the prior 28 days. CryptoCompare volume data are available starting in January 21, 2015 (so the first 28 day period is available in February 2015). CryptoCompare determines whether an exchange is classified as "Top Tier" - exchanges with grades of "B" thru "AA." See, e.g., https://data.cryptocompare.com/reports/exchange-benchmark-july-2020.

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Exhibit 16
XRP Price and Volatility
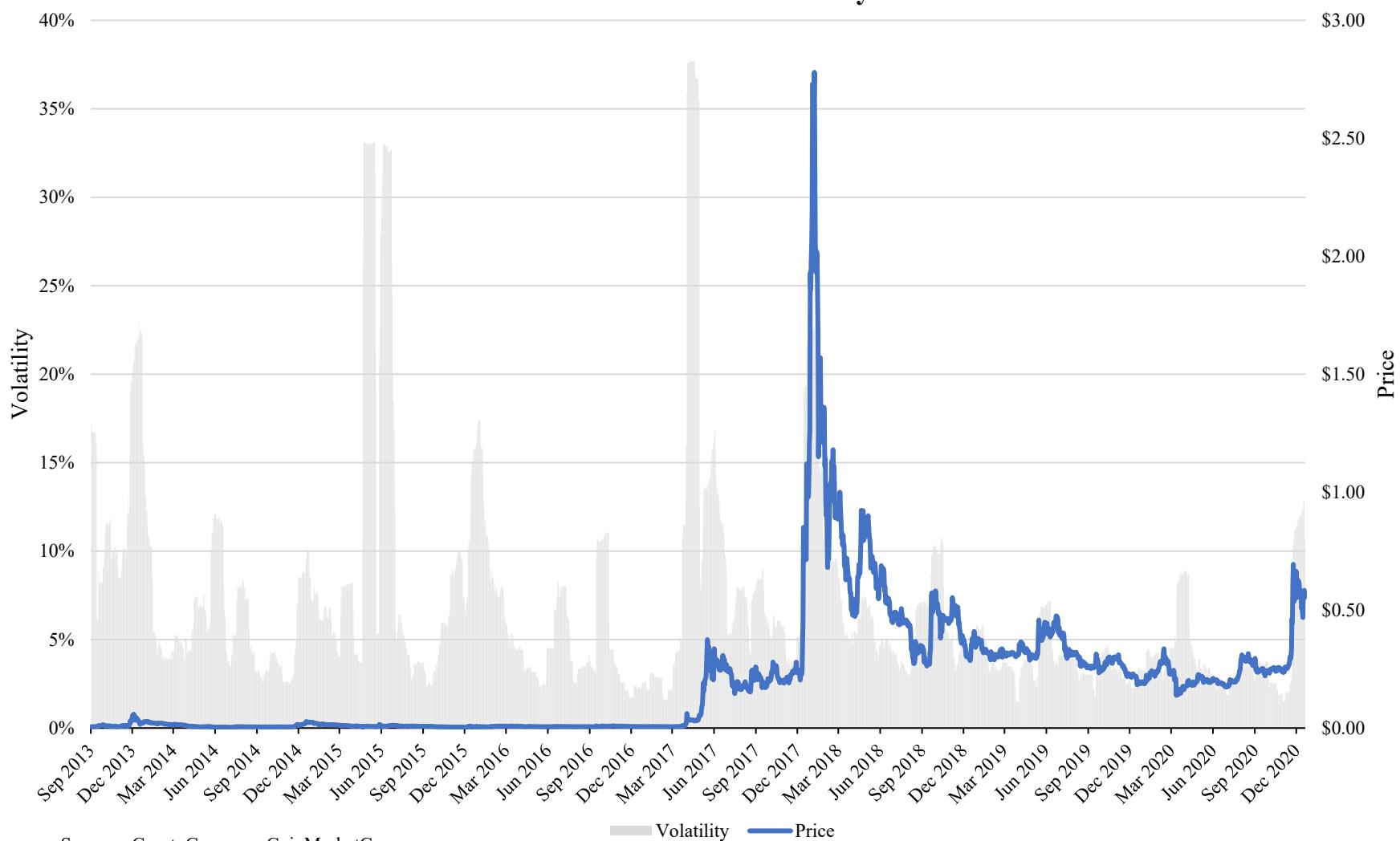
Sources: CryptoCompare; CoinMarketCap.

Notes:
[1] Price is price as of midnight UTC ("close").
[2] Volatility is the standard deviation of daily returns over the prior 28 days.
[3] Prior to January 21, 2015, XRP price data are based on CoinMarketCap.

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Exhibit 17
MoneyGram's Use of ODL Showing Remittances by Corridor

Total ODL Traffic in USD	AUD-PHP	AUD-USD	EUR-USD	USD-MXN	USD-PHP	Total
2019 July	$ -	$ -	$ -	$ 138,220	$ -	$ 138,220
2019 August	$ -	$ -	$ -	$ 7,807,605	$ -	$ 7,807,605
2019 September	$ -	$ -	$ -	$ 11,758,388	$ -	$ 11,758,388
2019 October	$ -	$ -	$ -	$ 25,399,274	$ 40	$ 25,399,313
2019 November	$ 58,840	$ 547,450	$ 1,494,706	$ 43,942,594	$ 470,050	$ 46,513,641
2019 December	$ 1,933,266	$ 4,670,588	$ 12,965,466	$ 61,749,097	$ 6,779,159	$ 88,097,576
2020 January	$ 5,075,082	$ 9,981,819	$ 30,201,800	$ 89,433,828	$ 19,457,884	$ 154,150,413
2020 February	$ 14,254,244	$ 23,877,443	$ 72,785,063	$ 107,356,161	$ 35,351,853	$ 253,624,764
2020 March	$ 16,804,238	$ 26,492,307	$ 100,498,331	$ 107,748,321	$ 40,186,614	$ 291,729,810
2020 April	$ 12,162,601	$ 75,618,666	$ 121,216,291	$ 160,873,650	$ 40,682,366	$ 410,553,573
2020 May	$ -	$ 80,390,127	$ 126,306,888	$ 155,595,243	$ 47,231,500	$ 409,523,758
2020 June	$ -	$ 23,519,202	$ 40,470,366	$ 50,331,417	$ 13,279,600	$ 127,600,585
2020 July	$ -	$ 9,447,010	$ 28,396,155	$ 31,081,112	$ 4,644,642	$ 73,568,919
2020 August	$ -	$ 8,418,192	$ 26,003,744	$ 30,652,076	$ 4,275,753	$ 69,349,766
2020 September	$ -	$ 9,205,588	$ 29,082,888	$ 33,386,777	$ 4,467,384	$ 76,142,637
2020 October	$ -	$ 8,864,469	$ 33,577,390	$ 37,549,751	$ 4,487,514	$ 84,479,124
2020 November	$ -	$ 9,730,977	$ 41,241,107	$ 45,937,307	$ 4,423,126	$ 101,332,517
2020 December	$ -	$ 3,364,530	$ 14,162,499	$ 14,200,715	$ 1,434,120	$ 33,161,864
Total per Corridor	$ 50,288,270	$ 294,128,368	$ 678,402,696	$ 1,014,941,537	$ 227,171,604	$ 2,264,932,476

Source: Detailed ODL transaction data received from MoneyGram. SEC-LIT-EPROD-000077198, SEC-LIT-EPROD-000075518, SEC-LIT-EPROD-000073620, SEC-LIT-EPROD-000075553, SEC-LIT-EPROD-000075486, SEC-LIT-EPROD-000075476, SEC-LIT-EPROD-000071477, MONEYGRAM_SEC_0017277.

Notes: A November 25, 2019 transfer in the AUD-PHP corridor appears to have an errant Reuters Benchmark figure, which results in an FX Disadvantage of 4942 BPS. As a result, this transfer was omitted from this analysis.

Exhibit 18
MoneyGram ODL
Percentage of Failed Transfer by Corridor
July 2019 - December 2020

Corridor	All Corridors				USD-MXN	AUD-PHP	AUD-USD	EUR-USD	USD-PHP
	Failed Transfers	Completed Transfers	Total Transfers	Ratio	Ratio	Ratio	Ratio	Ratio	Ratio
	[A]	[B]	[C]	[A] / [C]					
July 2019	6	47	53	11.32%	11.32%	-	-	-	-
August 2019	14	430	444	3.15%	3.15%	-	-	-	-
September 2019	63	599	662	9.52%	9.52%	-	-	-	-
October 2019	163	1753	1916	8.51%	8.51%	-	-	-	-
November 2019	128	1828	1956	6.54%	4.92%	13.16%	6.25%	0.00%	42.86%
December 2019	122	7771	7893	1.55%	1.79%	5.17%	2.28%	0.00%	1.77%
January 2020	303	16831	17134	1.77%	1.57%	4.01%	4.26%	0.10%	0.70%
February 2020	396	13164	13560	2.92%	6.51%	2.85%	3.72%	0.26%	1.36%
March 2020	82	17001	17083	0.48%	0.81%	0.70%	0.08%	0.00%	0.76%
April 2020	19	18757	18776	0.10%	0.36%	0.04%	0.02%	0.00%	0.06%
May 2020	27	15458	15485	0.17%	0.72%	-	0.00%	0.00%	0.00%
June 2020	0	15545	15545	0.00%	0.00%	-	0.00%	0.00%	0.00%
July 2020	40	16240	16280	0.25%	1.01%	-	0.00%	0.00%	0.00%
August 2020	1	14891	14892	0.01%	0.03%	-	0.00%	0.00%	0.00%
September 2020	31	15821	15852	0.20%	0.77%	-	0.00%	0.00%	0.00%
October 2020	11	15263	15274	0.07%	0.28%	-	0.00%	0.00%	0.00%
November 2020	19	12656	12675	0.15%	0.54%	-	0.00%	0.00%	0.00%
December 2020	0	4135	4135	0.00%	0.00%	-	0.00%	0.00%	0.00%
Total	1425	188190	189615	0.75%	1.64%	1.98%	0.52%	0.03%	0.37%

Source: Detailed ODL transaction data received from MoneyGram. SEC-LIT-EPROD-000077198, SEC-LIT-EPROD-000075518, SEC-LIT-EPROD-000073620, SEC-LIT-EPROD-000075553, SEC-LIT-EPROD-000075486, SEC-LIT-EPROD-000075476, SEC-LIT-EPROD-000071477, MONEYGRAM_SEC_0017277.
Notes: This table calculates the ratio of Failed Transfers to (Failed+Completed) Transfers. It ignores transactions labeled as "PREPARED" or "EXECUTED."

Exhibit 19
Average Monthly FX Disadvantage by Corridor
(Basis Points)

Average FX Disadvantage (BPS)	AUD-PHP	AUD-USD	EUR-USD	USD-MXN	USD-PHP
2019 July	-	-	-	-	-
2019 August	-	-	-	53.1	-
2019 September	-	-	-	66.0	-
2019 October	-	-	-	65.2	-
2019 November	-	72.8	74.2	70.7	96.8
2019 December	117.9	72.2	59.5	67.7	81.0
2020 January	101.7	56.4	50.0	62.9	77.4
2020 February	103.8	66.4	76.7	70.5	72.1
2020 March	108.4	71.9	77.1	59.7	71.7
2020 April	96.2	64.0	51.7	59.9	61.3
2020 May	-	58.4	41.8	42.5	49.0
2020 June	-	49.5	30.8	32.3	42.2
2020 July	-	37.9	35.4	32.7	43.6
2020 August	-	52.7	34.7	26.9	62.6
2020 September	-	62.6	34.3	8.7	48.8
2020 October	-	26.9	22.2	12.0	55.7
2020 November	-	25.4	22.8	19.5	62.1
2020 December	-	47.4	27.0	32.8	70.6
Average per Corridor	105.6	54.6	45.6	46.1	63.9

Source: Detailed ODL transaction data received from MoneyGram. SEC-LIT-EPROD-000077198, SEC-LIT-EPROD-000075518, SEC-LIT-EPROD-000073620, SEC-LIT-EPROD-000075553, SEC-LIT-EPROD-000075486, SEC-LIT-EPROD-000075476, SEC-LIT-EPROD-000071477, MONEYGRAM_SEC_0017277.

Notes:

1. The FX Disadvantage is the difference between the Reuters Benchmark and the Ripple Exchange Rate expressed as a percentage of the Ripple Exchange Rate, including the impact of the exchange fees.

2. Average Monthly FX Disadvantage is only calculated for months with over $200,000 in notional USD volume for a particular corridor.

Exhibit 20
Average Monthly Cost Reductions by Corridor
August 2019 - December 2020

Average Monthly Cost Reduction (BPS)	AUD-PHP	AUD-USD	EUR-USD	USD-MXN	USD-PHP
FX Spread [1]	-3.67	-2.77	-3.76	-3.21	-2.10
Originating Exchange Cost	0.00	0.00	-0.14	-0.37	-0.13
Receiving Exchange Cost	0.00	-0.13	-0.14	-0.01	0.00
FX Disadvantage [2]	-3.67	-2.90	-4.04	-3.59	-2.23

Source: Detailed ODL transaction data received from MoneyGram. SEC-LIT-EPROD-000077198, SEC-LIT-EPROD-000075518, SEC-LIT-EPROD-000073620, SEC-LIT-EPROD-000075553, SEC-LIT-EPROD-000075486, SEC-LIT-EPROD-000075476, SEC-LIT-EPROD-000071477, MONEYGRAM_SEC_0017277.

Notes:

1. The FX Spread is the difference between the Reuters Benchmark and the Ripple Exchange Rate expressed as a percentage of the Ripple Exchange Rate, before accounting for exchange fees.

2. The FX Disadvantage is the difference between the Reuters Benchmark and the Ripple Exchange Rate expressed as a percentage of the Ripple Exchange Rate, including the impact of the exchange fees.

3. All metrics are calculated using only months with over $200,000 in notional USD volume for a particular corridor.

Exhibit 21
Stylized Break-Even Analysis of ODL versus Traditional Remittance Assuming Lower Market Liquidity
Based on Estimated, Average Numbers

	Average Percentage Fees	Notional Amount of Remittance in USD				
		[1]**	[2]	[3]	[4]	[5]
Notional Amount		$2,184.18	$10,000.00	$22,477.95	$50,000.00	$1,000,000.00
Transfer using ODL						
Bitstamp Fee [1]	0.10%	$2.18	$10.00	$22.48	$50.00	$1,000.00
Bitso Fee [1]	0.05%	$1.09	$5.00	$11.24	$25.00	$500.00
Average ODL FX Spread [2]	0.55%	$11.94	$54.68	$122.90	$273.38	$5,467.58
ODL Notional (with fees)		$2,199.39	$10,069.68	$22,634.57	$50,348.38	$1,006,967.58
Total Cost Incurred (ODL)		$15.22	$69.68	$156.62	$348.38	$6,967.58
Transfer using Traditional						
Notional Amount		$2,184.18	$10,000.00	$22,477.95	$50,000.00	$1,000,000.00
Bank Transfer Fee [3]		$15.00	$15.00	$15.00	$15.00	$15.00
Average FX Spread [2]	0.01%	$0.22	$1.00	$2.25	$5.00	$100.00
Traditional Notional (with fees)		$2,199.39	$10,016.00	$22,495.20	$50,020.00	$1,000,115.00
Total Cost Incurred (Traditional)		$15.22	$16.00	$17.25	$20.00	$115.00
Cost Difference (ODL - Traditional)		**$0.00**	**$53.68**	**$139.37**	**$328.38**	**$6,852.58**

Source: SEC preclearance letter dated November 22, 2019, SEC-LIT-EPROD-000071389.

Notes:

[1] Percentage exchange fees based on figures in Preclearance letter, Exhibit 1, p. 21.

[2] Average FX spread is based on discussion in Preclearance letter, Exhibit 1, p. 18.

[3] Bank transfer fee is a flat fee at $15.

** Stylized example of break-even size analysis assuming no reduction in costs of using ODL versus traditional remittances.

Exhibit 22
Stylized Break-Even Analysis of ODL versus Traditional Remittance Assuming Higher Market Liquidity
Based on Estimated, Average Numbers

	Average Percentage Fees	Notional Amount of Remittance in USD				
		[1]**	[2]	[3]	[4]	[5]
Notional Amount		$7,494.82	$10,000.00	$22,477.95	$50,000.00	$1,000,000.00
Transfer using ODL						
Originating Exchange Fee [1]	0.05%	$3.76	$5.01	$11.27	$25.07	$501.38
Receiving Exchange Fee [1]	0.05%	$3.75	$5.00	$11.24	$25.00	$500.00
Average ODL FX Spread [1]	0.11%	$8.24	$11.00	$24.73	$55.00	$1,100.00
ODL Notional (with fees)		$7,510.57	$10,021.01	$22,525.18	$50,105.07	$1,002,101.38
Total Cost Incurred (ODL)		$15.75	$21.01	$47.23	$105.07	$2,101.38
Transfer using Traditional						
Notional Amount		$7,494.82	$10,000.00	$22,477.95	$50,000.00	$1,000,000.00
Bank Transfer Fee [2]		$15.00	$15.00	$15.00	$15.00	$15.00
Average FX Spread [3]	0.01%	$0.75	$1.00	$2.25	$5.00	$100.00
Traditional Notional (with fees)		$7,510.57	$10,016.00	$22,495.20	$50,020.00	$1,000,115.00
Total Cost Incurred (Traditional)		$15.75	$16.00	$17.25	$20.00	$115.00
Cost Difference (ODL - Traditional)		**$0.00**	**$5.01**	**$29.99**	**$85.07**	**$1,986.38**

Sources:

SEC preclearance letter dated November 22, 2019, SEC-LIT-EPROD-000071389.

Detailed ODL transaction data received from MoneyGram. SEC-LIT-EPROD-000077198, SEC-LIT-EPROD-000075518, SEC-LIT-EPROD-000073620, SEC-LIT-EPROD-000075553, SEC-LIT-EPROD-000075486, SEC-LIT-EPROD-000075476, SEC-LIT-EPROD-000071477, MONEYGRAM_SEC_0017277.

Notes:

[1] Percentage exchange fees and ODL FX Spread are the average of the USD-MXN fees over the period October through December 2020.

[2] Bank transfer fee is a flat fee at $15.

[3] Average FX spread is based on discussion in Preclearance letter, Exhibit 1, p. 18.

** Stylized example of break-even size analysis assuming no reduction in costs of using ODL versus traditional remittances.

Appendix A

October 2021

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███████████████

CURRENT POSITIONS

Greenfield Professor of Securities Law, Harvard Law School

Visiting Professor, Stanford Law School

National Bureau of Economic Research, Research Associate

Member of Editorial Board, Journal of Financial Perspectives

Fellow, Columbia University's Program on the Law and Economics of Capital Markets

Faculty Associate, Kennedy School of Government

Research Associate, European Corporate Governance Institute

EDUCATION

Massachusetts Institute of Technology, Ph.D. in Economics, 2005
Fields in econometrics and finance

Harvard Law School, J.D., 1995, *Magna Cum Laude*

- Recipient of the *Sears Prize* (award given to the two students with the highest grades)
- Editor, *Harvard Law Review*

Brown University, B.A. and M.A., 1992, *Magna Cum Laude*

PREVIOUS POSITIONS

Harvard University Fellow
Harvard Law School, 1997

Law Clerk, Justice Anthony M. Kennedy
Supreme Court of the United States; 1996 Term

Law Clerk, Honorable Laurence H. Silberman
United States Court of Appeals for the District of Columbia; 1995 Term

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COURSES TAUGHT

Contracts
Corporate Finance
Law and Finance
Securities Litigation & Regulation

REFEREE FOR FOLLOWING JOURNALS

American Law and Economics Review
Journal of Corporation Finance
Journal of Finance
Journal of Financial Perspectives
Journal of Law and Economics
Journal of Law, Economics and Organization
Journal of Legal Studies
Quarterly Journal of Economics

CONSULTING AREAS

Price Impact and Securities Damages, Valuation, Mergers & Acquisitions

Papers

"Are Star Law Firms Better Law Firms?" with Manconi, Neretina, Powley & Renneboog, Working Paper (2021)

"How Accurate are Matrix Bond Prices?" with Drew Roper & Yibai Shu, Working Paper (2018)

"New Special Study of the Securities Markets: Intermediaries" with John Morley in SECURITIES MARKET ISSUES FOR THE 21ST CENTURY (2018) (editors Fox, Glosten, Greene and Patel)

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Data:

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APPENDIX C

DATA USED IN EMPIRICAL ANALYSIS

A.   CRYPTOCURRENCY MARKET INFORMATION

1.   I use two data sources for cryptocurrency prices, trading volume, circulating supply, and market capitalization: CryptoCompare[1] and CoinMarketCap.[2] Both sources have been used in the academic literature.[3] I use information from CryptoCompare for prices, XRP trading volume, and the number of exchanges on which XRP trades. I use information from CoinMarketCap for prices, market capitalization, and XRP's circulating supply. For cryptocurrency prices, when available, I use CryptoCompare price information, and CoinMarketCap price information otherwise.[4] The table below summarizes the main cryptocurrency variables used in my various analyses.

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[1] *See* https://www.cryptocompare.com/.

[2] *See* https://coinmarketcap.com/.

[3] *See*, *e.g.*, Liu, Y., A. Tsyvinski, and X. Wu, "Common Risk Factors in Cryptocurrency," *Journal of Finance, Forthcoming,* 2021, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3379131 at 7 ("We collect trading data of all cryptocurrencies available from Coinmarketcap.com. Coinmarketcap.com is a leading source of cryptocurrency price and volume data."); Lyons, R., and G. Viswanath-Natraj, "What keeps stablecoins stable?" *Working paper*, May 2021 at 50 ("CryptoCompare: Price and trading volume data for currencies (based on a representative list of crypto exchanges).").

[4] For example, for XRP, I use CryptoCompare for January 21, 2015-December 20, 2020, and CoinMarketCap for August 6, 2013-January 20, 2015.

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Exhibit C.1
Cryptocurrency Variables Used in Analyses

Variable	Description	Source	Field Name(s) in Dataset
Cryptocurrency Price	Price (in U.S. dollars) as of midnight UTC	CryptoCompare when available, otherwise CoinMarketCap	*close* (CryptoCompare); *close_usd* (CoinMarketCap)
XRP Trading Volume	XRP volume in previous 24 hours (in U.S. dollars)	CryptoCompare	*total_volume_total*; *top_tier_volume_total*
Cryptocurrency Market Cap	"The total market value of a cryptocurrency's circulating supply." [1]	CoinMarketCap	*marketcap_usd*
XRP Circulating Supply	"The amount of coins that are circulating in the market and are in public hands." [2]	CoinMarketCap	*circulating_supply*
Number of Exchanges on Which XRP Trades	Count of exchanges for which CryptoCompare has information on XRP trading	CryptoCompare	*histo_minute_start*; *volume* (for determining day with positive volume)

Notes:

[1] *See* description of "Market Cap" at https://coinmarketcap.com/

[2] *See* description of "Circulating Supply" at https://coinmarketcap.com/

B.   ESTIMATION PERIODS

2.   As I explained in Section III, I implemented my regression analyses for two estimation periods: August 6, 2013 - December 15, 2020 ("Estimation Period 1") and August 11, 2015 - December 20, 2020 ("Estimation Period 2"). August 6, 2013, the first date in Estimation Period 1, is the first Tuesday for which XRP prices are available at cryptocurrency exchanges. August 11, 2015, the first date in Estimation Period 2, is the first Tuesday after Ethereum (ETH) started trading. Both estimation periods end on or shortly prior to December 20, 2020.[5]

3.   I use 28-day periods for Estimation Period 1 ending on December 15, 2020. The last monthly period in Estimation Period 2 has only 26 days (ending on Dec. 20, 2020). I adjust the returns for this last 26-day period to make it comparable to all the other 28-day periods by multiplying the returns by the ratio of 28/26.

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[5] I use December 20, 2020 as the end date of my analysis period to avoid potential price effects following the SEC's complaint. The anticipation of the SEC's complaint was made public on December 21, 2020 (*see*, *e.g.*, https://fortune.com/2020/12/21/ripple-to-be-sued-by-sec-cryptocurrency-xrp/), and the complaint was filed on December 22, 2020.

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C.   **CRYPTOCURRENCY PRICE RETURNS USED IN REGRESSION ANALYSIS**

4.   The price returns of cryptocurrencies are used in my analysis of long-run XRP price returns both as a dependent variable (the price return of XRP) and in the construction of the cryptocurrency factors (non-XRP cryptocurrencies). As I explained in Section III, I define the 28-day price return as: *Price (day t+28) / Price (day t) – 1*, with prices measured at midnight UTC.

5.   In all my regression analyses, cryptocurrency price returns are based on cryptocurrency coins (*i.e.*, excluding tokens[6]) with available price data throughout the relevant estimation period at every 28-day endpoint.[7] For example, for Estimation Period 1 (Tuesday, August 6, 2013 to Tuesday, December 15, 2020), I examine all non-token cryptocurrencies with available price data every 28 days (August 6, 2013, September 3, 2013, … and December 15, 2020).

6.   In addition, for Estimation Period 2, given the large number of potential coins – many of which are small and may include less reliable price information and/or are affected by different factors than large coins such as XRP – I further restrict the sample of coins to those which had a market capitalization of at least $100,000 according to CoinMarketCap on August 7, 2015 and/or December 21, 2020.[8] For comparison, on those two days, XRP market capitalization far exceeded that cutoff and was $260 million and $23 billion, respectively. My regression

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[6] I use the CoinMarketCap designation of "token." *See*, https://coinmarketcap.com/tokens/.

[7] I also require at each 28-day endpoint that the coin have a non-zero market capitalization because zero or missing market capitalization may be related to less reliable pricing information. This additional restriction results in one less available coin during Estimation Period 1, and 20 less available coins during Estimation Period 2.

[8] My decision to restrict the sample based on market capitalization is also supported by the academic literature. *See*, for example, Liu et al. (2021) who restrict the coins in their sample to those with a market cap of over $1 million. Liu, Y., A. Tsyvinski, and X. Wu, "Common Risk Factors in Cryptocurrency," *Journal of Finance, Forthcoming,* 2021, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3379131.

analyses use 10 coins for Estimation Period 1 (August 6, 2013 to December 15, 2020),[9] and 92

coins for Estimation Period 2 (August 11, 2015 to December 20, 2020),[10] including XRP, which

are the coins that comprise my dataset for analysis.[11]

D.   **THE RISK-FREE RATE AND OTHER FINANCIAL INDICES**

7.   In my regression analysis, I examine all 28-day price returns relative to the risk-

free rate of return. I calculate the risk-free rate of return using the 1-Month Treasury Rate from

Federal Reserve Economic Data (FRED).[12] I then pro-rate the monthly treasury rate to a 28-day

rate of return and subtract it from all return variables (*i.e.*, for XRP, for non-XRP coins used to

construct cryptocurrency factors, and for the non-cryptocurrency 28-day returns).

8.   I also incorporate non-cryptocurrency financial indices and commodity prices into

my analysis. I used Bloomberg as a source for these measures. I examined the S&P 500 Index,[13]

the MCSI World Index,[14] and Emerging Markets equity indices;[15] the Bloomberg Commodity

Index (BCOM);[16] the price of gold; and information for three major fiat currencies: U.S. Dollar

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[9] The 10 coins' (including XRP) market cap represent more than 99% and 76% of the market cap of all coins (tokens excluded) on August 4, 2013 and December 21, 2020, respectively.

[10] The 92 coins' (including XRP) market cap represent more than 98% and 90% of the market cap of all coins (tokens excluded) on August 7, 2015 and December 21, 2020, respectively.

[11] *See* a list of the 20 largest 20 coins on August 11, 2020 in Exhibit 4, the first day of Estimation Period 2.

[12] Series DGS1MO, available at https://fred.stlouisfed.org/series/DGS1MO.

[13] An index of large capitalization equities. For more details on the index, *see* the Factsheet available at https://www.spglobal.com/spdji/en/indices/equity/sp-500/.

[14] "The MCSI World Index captures large and mid-cap representation across 23 Developed Market countries. With 1,559 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country." For more details on the index's construction, *see* the Factsheet available at: https://www.msci.com/documents/10199/149ed7bc-316e-4b4c-8ea4-43fcb5bd6523.

[15] "The MCSI Emerging Markets Index captures large and mid-cap representation across 27 Emerging Markets countries. With 1,406 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country." For more details on the index's construction, *see* the factsheet available at: https://www.msci.com/documents/10199/c0db0a48-01f2-4ba9-ad01-226fd5678111.

[16] "The index is made up of 23 exchange-traded futures on physical commodities…" For more details on the index's construction, *see* the factsheet available at: https://data.bloomberglp.com/professional/sites/10/BCOM-Fact-Sheet-2.pdf.

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Index (USDX), Euro (price denominated in U.S. Dollars), and Japanese Yen (price denominated

in U.S. Dollars). I constructed these 28-day returns in an analogous way to the cryptocurrency

returns and subtracted from each the same risk-free rate.[17] The table below summarizes the main

non-cryptocurrency variables used in my various analyses.

Exhibit C.2
Non-Cryptocurrency Variables Used in Analyses

Variable	Description	Source	Field Name in Dataset
Price of Gold	Gold spot price (in U.S. dollars)	Bloomberg	*XAU*
Bloomberg Commodity Index (BCOM)	Index of commodity futures	Bloomberg	*BCOM*
S&P 500 Index	S&P 500 Index	Bloomberg	*SPX*
MCSI World Index	Index of equities in Developed Markets countries	Bloomberg	*MXWO*
MCSI Emerging Markets Index	Index of equities in Emerging Markets countries	Bloomberg	*MXEF*
Euro	Price of Euro in U.S. dollars	Bloomberg	*EURUSD*
Japanese Yen	Price of Japanese Yen in U.S. dollars	Bloomberg	*JPYUSD*
US Dollar Index (USDX)	The value of the U.S. dollar relative to a basket of major currencies	Bloomberg	*USDX*
1-Month Treasury Rate	1-Month U.S. Treasury Constant Maturity Rate	Federal Reserve Economic Data (FRED)	*DGS1MO*

E.   PRINCIPAL COMPONENTS ANALYSIS (PCA) IMPLEMENTATION

9.   I constructed the cryptocurrency market factors by using the principal components

of the *non-XRP* returns of the coins. The PCA decomposition is based on the covariance of the

returns of 9 and 91 coins during Estimation Period 1 and Estimation Period 2, respectively.[18]

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[17] When constructing the 28-day returns for traditional assets and the risk-free rate, in instances where information was missing for a particular date, I used the preceding date on which information was available. For example, I used July 3, 2017 prices and indices for July 4, 2017 prices and indices that were unavailable on July 4, 2017.

[18] Specifically, I used the covariance decomposition option is *Stata*'s built-in *pca* routine. *Stata* is a commonly-used statistical package. *See* https://www.stata.com/manuals/mvpca.pdf.

F.   DATA ON XRP FLOWS FROM/TO RIPPLE

10.   The calculation of Ripple's net XRP distributions – *i.e.*, for any given period

flows of XRP from Ripple less flows of XRP into Ripple – are based on Ripple's reporting files

for January 2013 – December 2020.[19] The main source of data within each of these files is

record-level data. The record-level data includes information about date, amount of XRP

transferred, and for many (but not all) records, the "Name" and "Account ID" for the source and

destination of the XRP transfer. In addition, the files also include monthly account balances for

Ripple's accounts, and monthly changes in balances are used to reconcile and supplement the

record-level data, as detailed below.

11.   In the record-level data, the field "Delivered Amount" records the amount of XRP

transferred. Throughout, a negative delivered amount is considered an outflow *from* a Ripple

account while a positive amount is considered an inflow *into* a Ripple account. However, the

data also include information on transfers between various types of Ripple accounts. Overall,

there are three types of accounts in the data: 1) Ripple's "Main Balance" accounts; 2)

"Reserved" accounts; and 3) "Custody" accounts. I understand the Main Balance consist of

Escrow and other Ripple accounts over which Ripple has control. I understand that Reserved

accounts are XRP funds set aside by Ripple following an agreement with another party or plan to

distribute XRP. I understand Custody accounts are administrated by Ripple on behalf of the

entity which has control of the funds in the Custody account, and Ripple is merely providing an

administrative service. As such, in the data there are four types of transactions: 1) between a

Ripple (Main Balance) and a non-Ripple entity; 2) between two Ripple accounts, both of which

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[19] The files and the range of dates used from each file are as follows: *RPLI_SEC 1100595* (January 2013 –
September 2014); *RPLI_SEC 1100594* (October 2014 – December 2015); *RPLI_SEC 1100596* (January 2016 -
December 2017); *RPLI_SEC 0304726* (January – December 2018); *RPLI_SEC 0304724* (January – December
2019); and *RPLI_SEC 0304725* (January – December 2020).

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are part of Ripple's Main Balance; 3) between a Custody or Reserved account and a non-Ripple entity; and 4) between a Custody or Reserved account and an account which is part of Ripple's Main Balance.

12.   To avoid double counting, transfers between Ripple's Main Balance accounts are ignored, and are often designated in the data as "Internal." Note that the data include records, for example, of a transfer from Ripple's Main Balance to a Custody account, and then from that Custody account to a non-Ripple entity. As such, it's imperative to avoid double counting the two records in the above example, as I understand they represent only a single distribution from Ripple to the non-Ripple entity (via the Custody account).

13.   The date of each distribution in the data is calculated as follows. For transfers involving Ripple's Main Balance, the date on which the transfer occurred is used. For transfers and adjustments (further discussed below) missing an exact date, the first date of the month on which the distributions occurred is used.[20] For transfers involving a Reserved or Custody account, the date on which the transfer first occurred is used.[21] I understand this is also consistent with how Ripple reports its data.[22] For example, Ripple may set up and transfer to a Custody account 1 million XRP on Jan. 1, 2015. The funds may stay in that account until the relevant non-Ripple entity directs Ripple to withdraw the XRP funds from the Custody account on May 1, 2015. In the distribution data used for the analyses, the XRP are considered distributed on Jan. 1, 2015, as I understand they were available for the non-Ripple entity since that day.

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[20] Note that my analyses involving distributions are focused on the monthly frequency and as the exact timing during the month is not as crucial.

[21] If the information is not available for a specific Reserved or Custody account transfer, the month in which we see the balance changes from Ripple's Main Balance and subsequent increase in the Reserved or Custody account is used.

[22] *See*, *e.g.*, https://ripple.com/xrp/market-performance/ ("Total [XRP distributed] includes business development agreements that are still pending.").

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14.   Last, in calculating net distributions for use in the analyses, the record-level data were adjusted by:[23] 1) converting values in fiat currencies to XRP (for a small set of the data); 2) resolving any discrepancies between the total distributions for the month and the change between the end-of-month balances (in most months there is no discrepancy); 3) for Custody accounts involving multiple records, ensuring the distribution was attributed to the (earlier) date on which the account was set up and ensuring a transaction is not double counted; 4) incorporating any additional needed information contained in Ripple's internal data files listed above. Some notable adjustments are detailed in Exhibit C.3 below:

Exhibit C.3
Adjustments in Ripple XRP Distributions Data

Date	Amount (XRP)	Description
March 2015	10,000,000	Flow related to Fidor Custody Account.[1]
November 2015	1,088,862,713	Flow related to ▮▮▮ Custody Account.[1]
March 2016	-3,500,000,000	Reserved account set up in March 2016 resulting in an outflow of 3.5 billion XRP to Reserved account ("Custody - RW & ▮▮▮ ▮▮▮").[2]
March 2016	2,000,000,000	"Transfer in as part of the Jed Settlement."[3]
June 2016	-2,000,000,000	Four transactions related to "Custody wallets for Jed DAF."[4]
January 2018 - February 2019	259,999,900	Inflows from Reserved accounts into Ripple Main Balance reconciling information related to options settlement.[5]

Notes:
[1] *See* Note B in "Monthly" tab, *RPLI_SEC 1100596.xlsx.*
[2] *See* Note E in "Monthly" tab, *RPLI_SEC 1100596.xlsx.*
[3] *See* Note D in "Monthly" tab, *RPLI_SEC 1100596.xlsx.*
[4] *See* Note G in "Monthly" tab, *RPLI_SEC 1100596.xlsx.*
[5] *See* Row 13 in "Monthly" tab, *RPLI_SEC 0304726.xlsx* and Row 56 in "Month" tab, *RPLI_SEC 0304724.xlsx.*

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[23] Minor discrepancies involving monthly discrepancies of less than 1,000 XRP per month were ignored.